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ENTRIES 3650–4717

BOTANICAL ABSTRACTS

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BOTANICAL ABSTRACTS

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J. R. SCHRAMM, Editor-in-Chief
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Vol. 12 JULY–AUGUST, 1923 No. 6

ENTRIES 3650–4717

AGRONOMY

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(See also in this issue Entries 3726, 3736, 3738, 3761, 3796, 3800, 3803, 3815, 3868, 3966, 4003, 4266, 4331, 4356, 4409, 4423, 4434, 4435, 4581, 4608, 4613, 4616, 4621)

3650. ANONYMOUS. **Championship field wheat competition in the central-western district.** Agric. Gaz. New South Wales 34: 1–5. 1923.—The points judged were yield, cleanliness, appearance (30 points each), trueness to type, freedom from disease, and eveness (20 points each). Methods of cultivation are given.—*L. R. Waldron.*

3651. ANONYMOUS. **Championship field wheat competition in the Riverina.** Agric. Gaz. New South Wales 34: 81–84. 1923.—Crops were scored on apparent yield, trueness to type, freedom from disease, evenness, cleanliness, condition and appearance. A field sown to Federation secured first place.—*L. R. Waldron.*

3652. ANONYMOUS. **Electro-culture.** Jour. Ministry Agric. Great Britain 29: 792–796. 1922.—A general summary is given of the results of field experiments from 1915 to 1920 on the influence of electrical discharge on plant growth, the work from 1918 on being under the direction of the Electro-Culture Committee.—" * * * Of the fourteen positive results of experiments extending over six years, only three are less than 10 per cent, while of the four negative results none reaches 10 per cent. Of the ten positive results with spring sown cereals only two are less than 10 per cent, and six show an increase of 30 per cent, or over; while of the two negative results both show decreases of less than 10 per cent. The results of field experiments with these spring crops show an average increase of 22 per cent. The effect of electrification in increasing the yield of spring-sown oats and barley has thus been demonstrated. A beneficial effect on clover-hay is probable, while that on winter-sown wheat is uncertain."—Alternating current is usually as effective as, or more effective than, direct current. An upward current through the plant increases growth in the same way as a downward current. A discharge applied for the first month only of the growing season may be at least as effective as one continued throughout the growing season.—*M. B. McKay.*

3653. ANONYMOUS. **Lumber from sugar-cane waste.** Sci. Amer. 126: 398. 1922.—The lumber, "celotex," is made from the cane fiber, or bagasse, remaining after the juice has been extracted. It is waterproof and has high insulating qualities, making it useful in the manufacture of refrigerators, fireless cookers, the walls of storage plants, etc. It also has many uses in house construction.—*Chas. H. Otis.*

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3654. Anonymous. **The regrassing experiments in Central Otago.** New Zealand Jour. Agric. 26: 97–100. *1 fig.* 1923.—A report by a special committee is presented concerning results of experiments outlined in Vol. 26 of the Journal.—*N. J. Giddings.*

3655. Anderson, B. G. **Experiments with dark tobacco and other crops.** Virginia Agric. Exp. Sta. Bull. 231. *19 p., 4 fig.* 1923.—Soil management, fertilizing, liming, and choice of varieties for dark tobacco and other field crops, grown in experimental plots at Appomattox, Virginia, are discussed.—*F. D. Fromme.*

3656. Atkinson, Esmond H. **Weeds and their identification.** New Zealand Jour. Agric. 25: 290–292. *1 fig.* 1922.—Field horsetail, *Equisetum arvense,* is an introduced weed which may cause trouble. The plant is described in some detail.—*N. J. Giddings.*

3657. Atkinson, Esmond H. **Weeds and their identification.** New Zealand Jour. Agric. 25: 351–353. *1 fig.* 1922.—Japanese wineberry, *Rubus phoenicolasius* Maxim, is described as a weed in some localities. It should be comparatively easy to eradicate.—*N. J. Giddings.*

3658. Atkinson, Esmond H. **Weeds and their identification.** New Zealand Jour. Agric. 24: 360–364. *2 fig.* 1922.—Cape honey flower (*Melianthus major L.*), originally introduced from South Africa, has found favorable conditions for growth and spread in New Zealand. It has been declared a weed. The plant is described in some detail.—*N. J. Giddings.*

3659. Bailey, E. M. **Commercial feeding stuffs.** Connecticut Agric. Exp. Sta. Bull. 238. *329–361.* 1922.—This bulletin reports the analyses of 159 official samples of feeding stuffs taken by the Station Agent and 57 samples submitted by individuals. A table is included giving coefficients of digestibility and net energy values of the feeding stuffs analyzed.—*Henry Dorsey.*

3660. Barnum, Clyde C. **The control of wild morning glory.** California Agric. Exp. Sta. Circ. 256. *22 p., 12 fig.* 1923.—The persistent growth of this plant after repeated cuttings is due to the large food reserves in the roots, which must be exhausted in order to kill the plant. Thorough cultivation during 1 growing season kills the plant in 1 year. The interval between cuttings should not be longer than 5 days, thus precluding the appearance of green leaves. Alfalfa, which yields profitable crops at the same time may kill out morning glory in 2–3 years, but straw or other cover does not check its growth. Hogs sometimes kill out morning glory by eating its roots, a method used extensively in the eastern states. Sheep aid by grazing on green parts of the plant. Salt brine kills the weed, but is recommended only for soil not used for growing crops. The use of sodium arsenite is not justified by the present investigations. Commercial weed-killers, largely solutions of sodium arsenite, are too expensive and it is not known just when they should be applied. For small patches carbon bisulfid is very satisfactory.—*A. R. C. Haas.*

3661. Bartlett, H. **Wheat crop competition, 1922. Forbes and Parks P. and A. associations.** Agric. Gaz. New South Wales 34: 15–23. 1923.—A general discussion of the contests is presented, emphasizing particularly the importance of fallowing, value of superphosphate, methods of cultivation, varieties, and seasonal conditions. Marshall's No. 3, Yandilla King, Canberra, and Hard Federation were the leading varieties. Contestants were scored on yield, type and purity, freedom from disease, eveness, cleanliness, and condition and appearance. Foot-rot and take-all are spreading and are expected to cause increased losses in the future.—*L. R. Waldron.*

3662. Bevan, W. **Chemical fertilizers.** Cyprus Agr. Jour. 18: 1–7. 1923.—It is claimed that the importation of commercial fertilizers has very materially increased during 1922. As considerations in using chemical manures, the author emphasizes manner and time of

application and quantity and type to be applied. Suggested amounts are given in tabular form for each agricultural crop.—*W. Stuart.*

3663. BEVAN, W. **Comfrey: A prolific forage crop.** Cyprus Agric. Jour. **18**: 7–8. 1923.—Comfrey is claimed to be native on the slopes of the Caucasian Mountains. The usual practice is to propagate from sets or from rooted plants. First year yields sometimes equal 50 tons per acre. Plants should not be allowed to flower. Cures of milk fever, foot-and-mouth disease wounds, etc., are ascribed to comfrey.—*W. Stuart.*

3664. BEVAN, W. **Ground nut cultivation in Cyprus.** Cyprus Agric. Jour. **18**: 13. 1923.—Successful production by the Cyprus Agricultural Department, has resulted in commercial growing. It is claimed that the Cyprus grown nuts are usually much superior in shape, size, and flavor to those imported from Egypt, and that as a result an export trade to Egypt is developing.—*W. Stuart.*

3665. BLAKELY, W. F. **Weeds of New South Wales.** Agric. Gaz. New South Wales **34**: 116–120. *2 fig.* 1923.—*Cleome spinosa* and *Silene quinquevulnera* are discussed and means of control are suggested.—*L. R. Waldron.*

3666. BROWN, H. B., and J. F. O'KELLY. **Report of the agronomy department.** Ann. Rept. Mississippi Agric. Exp. Sta. **34**: 16–22. 1921.—No consistent gain has resulted from any form or quantity of lime in a rotation of cotton, corn, and oats followed by a legume. In crop rotation work, plots cropped to corn continuously with cowpeas at last cultivation gave an increase of 7.7 bushels of corn over plots without the legume. Cowpeas and residual effect of 5 tons manure per acre applied the year before gave an increase of 9.8 bushels corn per acre on soil naturally poorer than the check plot. Plots in cotton continuously yielded 767 pounds more seed cotton to the acre where 5 tons manure were applied annually.—*J. F. O'Kelly.*

3667. CAUTHEN, E. F. **Comparison of peanut meal, cotton seed meal, velvet bean meal, ammonium sulphate, and nitrate of soda, as fertilizers for corn and cotton.** Alabama Agric. Exp. Sta. Bull. 215. *8 p.* 1921.—Yields from 3 tests with cotton and 2 with corn indicate that the effectiveness of these fertilizers as sources of nitrogen increases in the following order: velvet bean meal, 54; peanut meal, 87; cotton seed meal, 80; sulphate of ammonia (for corn only), 94; nitrate of soda, 100.—*W. A. Gardner.*

3668. COCKAYNE, L. **An economic investigation of the Montane Tussock-grassland of New Zealand.** New Zealand Jour. Agric. **24**: 321–334; **25**: 1–11, 129–144. *16 fig.* 1922.—The area under consideration consists of more than a half million acres at the base of the mountains and extending to an elevation of 3000 feet. It formerly supported a fairly dense cover of tussock grasses and various other plants which are listed. At present the land is largely barren dunes and the flora is very limited. The area has a limited rainfall, reported as not more than 14 inches in the most arid portions. The sun is bright and temperatures above 100°F. are frequent in summer. There are also violent winds which accelerate evaporation and are an important factor in erosion. The soil is comparatively rich. Excessive sheep grazing and burning combined with the depredations of rabbits destroyed many of the better forage plants and broke up the soil cover so that barren areas resulted. Experiments were designed to find out the principles, methods, and suitable plants upon which regrassing depends and whether regrassing can be accomplished. Seed was sown with and without harrowing. Spring and fall seedings were tried. The plots were located at altitudes of 1000–3000 feet, and included 1 part of the most seriously depleted area. A portion of each plot was not sown to determine whether locally growing plants might help materially in the regrassing. Some sowing was also done outside the enclosures. Merely keeping the land free from live stock did not give favorable results. Seed of the following plants appear to be well established at the end of the 2nd season: Chewings fescue (*Festuca rubra*), cocksfoot (*Dactylis glomerata*), tall

fescue (*Festuca elatior*), chicory (*Cichorium intybus*), lucerne (*Medicago sativa*), and yarrow (*Achillaea millefolium*).—*N. J. Giddings.*

3669. Committee on the Standardization of Field Experiments. **Bibliography of standardization of field experiments.** Jour. Amer. Soc. Agron. **15**: 33–40. 1923.—The references (155) are cited which were presented as part of a report at the meeting of the Society held at Washington, D. C., Nov. 21, 1922.—*F. M. Schertz.*

3670. Crooks, J. T. J. **The possibilities of Assam as a sugar-producing country.** Internat. Sugar Jour. **25**: 176–178. 1923.—A brief description is given of the soil, climate, vegetation, pests, and labor conditions. A few varieties of cane are grown commercially, principally seedlings from Java, Barbados, and Mauritius. These are not very successful and suggestions are made for experimenting with some of the seedling canes produced at the Coimbatore station in India such as CO 213, CO 214, and others.—*Caroline Rumbold.*

3671. De Baufre, Wm. L. **The heating value of corn.** Jour. Amer. Soc. Agron. **15**: 1–6. 1923.—The heating value of Nebraska corn (10 per cent moisture) is approximately 6,700 B. t. u. per pound while the corresponding value for Pittsburg, Kansas coal is 11,800 per pound. Consequently the heating value of 50 bushels of corn on the cob, or of 63 bushels of shelled corn, is about equivalent to 1 ton of bituminous coal.—*F. M. Schertz.*

3672. Dorpf-Petersen, K. **Beretning fra Statsfrökontrollen for det 51 Arbejdsaar. [Report of the State Control Station for the 51st year.]** Tidsskr. Planteavl **28**: 668–731. 1922. —This report deals particularly with the clover and grass seed situation in Denmark from July 1, 1921, to June 30, 1922. Voluminous statistics are presented.—*Albert A. Hansen.*

3673. Downing, R. G. **Field experiments with winter fodders. Grafton experiment farm.** Agric. Gaz. New South Wales **34**: 39–40. 1923.—Sunrise oats and vetches or peas have been found the most satisfactory combination for winter feed, resulting in an increased yield per acre of more than 2 tons over oats alone. Vetches and peas give about equal results when averaged over a period of years in combination with the cereals. Barley makes too slow a growth compared with oats and wheat and consequently gives a lessened yield. An application of 100 pounds of superphosphate per acre has been the best manurial treatment, giving a net profit of over £1 per acre.—*L. R. Waldron.*

3674. Dunshee, Carroll F. **Results of rice experiments in 1922.** California Agric. Exp. Sta. Bull. 354. *401–415.* 1923.—In plots submerged 8 inches no barnyard grass (*Echinochloa crus-galli*) appeared above the surface of the water. There was a scattering of the grass in the plots submerged 6 inches while a considerable quantity came through 4 inches of water. Plots submerged 2 inches were very foul with barynard grass. Water weeds other than the various types of barynard grass were not controlled to any extent by continuous submergence.—Plots submerged immediately after being drilled yielded a very inferior stand. Early seeding dates furnished most favorable conditions for increased yields. When land is free from alkali, little change occurs in the water by passing over the rice fields; but when soil contains soluble salts or alkali, some of this matter is carried away in drainage. How much goes into the subsoil is not known. Rice culture during 4 preceding years has not removed enough of the alkali to make the soil safe for sensitive crops.—*A. R. C. Haas.*

3675. Ferris, E. B. **Cotton experiments, 1922.** Mississippi Agric. Exp. Sta. Circ. 46. *8 p.* 1923.—Comparative results are given of standard varieties grown on the sandy loam soils of South Mississippi. Nitrates, as usual on these soils, produced profitable gains. Acid phosphate produced considerable increase but basic slag and raw phosphate rock were less efficient. A significant increase was produced by kainit and the leaves of the plants on the kainit plots were retained much better than on plots receiving no kainit. The increases due to sulphate of potash and to the double sulphate of potash and magnesia were practically the same.—*J. F. O'Kelly.*

3676. Foy, Nelson R. **Agricultural root seeds.** New Zealand Jour. Agric. 25: 293–296. *2 fig.* 1922.—The germination, purity, size and color, and adulteration of the seed of cultivated species of *Brassica* are discussed.—*N. J. Giddings.*

3677. Foy, Nelson R. **Cocksfoot seed.** New Zealand Jour. Agric. 25: 165–167. *1 fig.* 1922.—A report is presented on production, germination, weight, and purity of the seed of *Dactylis glomerata.*—*N. J. Giddings.*

3678. Foy, Nelson R. **Modern seed testing.** New Zealand Jour. Agric. 26: 65–72. *6 fig.* 1923.—Equipment and methods of seed testing used in the New Zealand inspection work are described.—*N. J. Giddings.*

3679. Foy, Nelson R. **Seed testing notes.** New Zealand Jour. Agric. 24: 299–301. *1 fig.* 1922.—Perennial rye grass, *Lolium perenne,* is discussed as to its germination, impurities, adulteration, and weight.—*N. J. Giddings.*

3680. Foy, Nelson R. **Seed testing notes. "Cheap" mixtures.** New Zealand Jour. Agric. 24: 224–225. 1922.—The author gives an analysis of a cheap, bargain mixture to show the worthlessness and expensiveness of such seed.—*N. J. Giddings.*

3681. Gardner, F. D., C. F. Noll, and R. D. Lewis. **Forty years' results with fertilizers. General fertilizer experiments.** Pennsylvania Agric. Exp. Sta. Bull. 175. *23 p., 3 fig.* 1922.—The author tabulates and summarizes the data from experiments initiated in 1882, the plan consisting in 144 1-acre plots arranged in 4 tiers. The plots are separated by 2-foot strips of blue-grass sod and the tiers by grass roadways. The crops grown are corn, oats, wheat, and mixed clover and timothy, each 1 year. On the 4 tiers there are growing all 4 crops each year. The plot treatments regarding cultivation, seeding, etc., conform to those of good farm practice, all plots receiving the same treatment except as to materials applied. Except burnt lime, which was applied only once in 4 years to corn, the fertilizers have been applied on alternate years to corn and wheat, the oats, clover and timothy receiving nothing. Mixed horse and cow manures with litter have been applied to sod before corn at irregular periods in the spring, and in the fall to oat stubble before winter wheat, but for any given application the manure has been of one kind and uniform. Nitrogen, in the form of nitrate of soda, dried blood, and sulphate of ammonia, has been applied at 24, 48, and 72 pounds an acre. Account has been taken of the phosphoric acid in the dried blood. Phosphoric acid has been applied uniformly at 48 pounds an acre. Muriate of potash has been applied to corn at the rate of 200 pounds an acre, with burnt lime at the rate of 2 tons an acre once in 4 years and with ground limestone at the same rate, applied on alternate years to corn and wheat.—The results show that the average yield of the untreated plots for the past 8 years has been only 57.6 per cent of that during the first 8 years of the experiment. Phosphoric acid is the first limiting factor in this soil, which is mainly a Hagerstown silt loam, and until this element is supplied, potash and nitrogen give little increase in yields. Plots receiving phosphoric acid alone have yielded 43.8 per cent more than the nearest checks. Potash alone has increased yields but 13.8 per cent, but when added to phosphoric acid has given an increase of 29.6 per cent over phosphoric acid alone. The authors believe that half the amount of potash used would have given as good results. Phosphoric acid and potash without nitrogen have given a greater net return than combinations including nitrogen and have practically maintained the fertility for the duration of the experiment. Nitrogen at 24 pounds per acre has not increased yields when used alone or in combination with any fertilizers. Possibly a lower rate of nitrogen application would have given a profit. Increasing nitrogen to 48 and 72 pounds has increased yields (except in the case of sulphate of ammonia) but not enough to affect the additional cost of the fertilizers. Nitrate of soda has slightly outyielded dried blood and greatly outyielded sulphate of ammonia. It is considered that the low yields accompanying sulphate of ammonia are due to the acidity induced by this fertilizer. At $1.50 a ton, a 6-ton application of manure on alternate years has given greater net returns

than any commercial fertilizer combination. Manure at $1.87 a ton gives a net return equivalent to that for the phosphoric acid and potash plots. The 8- and 10-ton applications of manure have not given profitable returns. Burnt lime at 2 tons an acre once in 4 years and ground limestone at the same rate once in 2 years on plots receiving no commercial fertilizer or manure have each caused a slight increase in yield and in crop value. Burnt lime with 6 tons of manure has increased the yields over lime alone. Land plaster at the rate of 320 pounds an acre every 2 years has not appreciably increased yields. Computations are made showing the relative advantage of one treatment over another.—*C. R. Orton.*

3682. Georgi, C. D. V. **Castor oil seeds. A note on oil content and extraction of oil.** Malayan Agric. Jour. 10: 191–192. 1922.—The amount of oil in locally grown seed is given and the constants found.—*I. H. Burkill.*

3683. Hansen, Albert A. **The toll of weeds in Indiana.** Proc. Indiana Acad. Sci. 1921: 105–109. 1922.—The losses are estimated under such headings as, tillage loss, reduced yield, cutting roadside weeds, etc. The total weed loss in Indiana for 1920 is estimated at $44,072,870 or $14 per capita per year. Correctives are summed up under 10 suggestions, including use of pure viable seed, killing weeds before maturity, clean cultivation, and cooperation among farmers.—*F. C. Anderson.*

3684. Hardy, H. C. **Burning up the corn.** Sci. Amer. 126: 244. 1922.—The use of corn as a source of heat when coal is high in price is discussed.—*Chas. H. Otis.*

3685. Haywood, A. H. **Dairying under North Coast conditions.** Agric. Gaz. New South Wales 34: 41–48. 1923.—Various methods are suggested for the production of dry and succulent fodder crops to be used during the winter season.—*L. R. Waldron.*

3686. Haywood, A. H. **Sugar-cane as fodder.** Agric. Gaz. New South Wales 34:100–102. 1923.—Notes are given on different varieties and suggestions are made as to methods of feeding.—*L. R. Waldron.*

3687. Hertel, H. **Landbruget i 1922. [Agriculture during 1922.]** Tidsskr. Landokonomi 1923[1]: 1–40. 1923.—This survey includes damage due to insects, etc. Seed from America is reported as of poor quality, principally because of the lack of proper recleaning before shipping. Nevertheless, American clover, timothy, and other grass seed are considered better than much of the seed imported from Germany.—*Albert A. Hansen.*

3688. Iversen, Karsten. **Beretning fra Statens Forsögsvirksomhed i Plantekultur. [Report from the State Agricultural Experiment Station.]** Tidsskr. Planteavl 28: 571–589. 1922.—The author reports on experiments from 1907 to 1910 in growing corn in Denmark for silage purposes. The preliminary work was not successful, but experiments will be continued.—*Albert A. Hansen.*

3689. Kennedy, P. B. **Leguminous plants as organic fertilizers in California agriculture.** California Agric. Exp. Sta. Circ. 255. *8 p.* 1922.—The author points out the advantages and desirability of growing leguminous plants as organic fertilizers in California.—*A. R. C. Haas.*

3690. Kennedy, P. B. **The small-seeded horse bean.** California Agric. Exp. Sta. Circ. 257. *23 p., 1 pl., 14 fig.* 1923.—The small-seeded horse bean is recommended as a valuable winter green manure crop, and to a less extent as a hay, silage, and seed crop for feeding livestock.—*A. R. C. Haas.*

3691. Kofahl. **Zur Stickstoffdüngung der Schmetterlingsblütler. [Fertilizing legumes with nitrates.]** Mitteil. Deutsch. Landw. Ges. 38: 66. 1923.—Treating lucerne with nitrate

of soda and peas and lupines with ammonium chloride was without noticeable effect.—*A. J. Pieters.*

3692. LEIJS, J. J. **Onze rijstcultuur. [Our rice growing.]** West Indië 4: 147–157. 1919.—A comparison is made of rice growing in the U. S. A. and in Surinam. Growing, harvesting, and thrashing are described.—*J. C. Th. Uphof.*

3693. LITTLE, L. G. **Lucerne top-dressing experiments. Five years' trial at Glen Innes experiment farm.** Agric. Gaz. New South Wales 34: 37–38. 1923.—Phosphoric acid and potash gave net positive results in all cases. The largest net gain was obtained from 200 pounds of superphosphate per acre.—*L. R. Waldron.*

3694. LITTLE, L. G. **Wheat variety trials at Cowra.** Agric. Gaz. New South Wales 34: 92. 1923.—The standard variety, Hard Federation, was outyielded by some of the newer and yet unnamed varieties.—*L. R. Waldron.*

3695. LONG, W. P. **Hubam in British Columbia.** Gleanings in Bee Culture 50: 88. *Fig. 1–2.* 1922.—Hubam clover on a trial plot at Vancouver seeded May 1. By July 17 it had made a growth of 4–5 feet and was beginning to bloom.—*J. H. Lovell.*

3696. LOWY, B. **Conserving crops by fumigation.** Sci. Amer. 127: 313. 1922.—The article concerns the use of carbon bisulfide and hydrocyanic acid gas for eliminating insects from rice and wheat in storage.—*Chas. H. Otis.*

3697. MCDONALD, A. H. E. **Wheat growing for profit.** Agric. Gaz. New South Wales 34: 104. 1923.—Wheat growing is probably the most profitable type of farming in Australia.—*L. R. Waldron.*

3698. MAKIN, R. N., and E. S. CLAYTON. **Farmers' experiment plots. Winter green fodder experiments, 1922.** Agric. Gaz. New South Wales 34: 85–92. *2 fig.* 1923.—Crops grown were wheat, oats, barley and rye and in some instances peas and vetches. The maximum yield of 17 tons was secured from Warden wheat and Golden vetches at Kyogle. Use of phosphates generally produced significantly increased yields.—*L. R. Waldron.*

3699. MARTIN, F. J., and R. E. MESSEY. **Experiments on wheat growing in the Sudan.** Wellcome Tropic. Res. Lab. Khartoum, Chem. Sec. Publ. 19. *24 p.* 1921.—Over 30,000 acres of wheat are grown in the Sudan, mainly in the provinces of Dongola and Berber. Annual precipitation at Khartoum is 4.9 inches; about 6 irrigations of $4\frac{3}{4}$ inches each are applied to the wheat crop. The soil at Khartoum, not considered heavy, contains over 40 per cent of clay. The native wheat is undesirable because of its long growing season, making it liable to attacks of stem rust (*Puccinia graminis*). Pure line selections were made of native wheats and varieties were imported from other countries. Only the earlier varieties, from Australia, India, and Egypt, have given good results. Even Egyptian varieties are rather late. The best yielding varieties were Firbank and Federation from Australia at about 35 bushels per acre; the native varieties yielded only 25 bushels. Full agronomic notes are given. The thrashed grain was hard and brittle, containing but 8–10 per cent of moisture and weighing up to 70 pounds per bushel. The milled flour was rather dark in all cases owing to primitive milling methods. Determinations were made of protein, dry and wet gluten, gliadin, glutenin, and diastatic capacity. Protein content varied from 9.8 to 10.9 per cent. Diastatic capacity was low. Baking results showed several of the wheats, including 2 native wheats, to produce loaves very nearly as large as those made from roller-milled Australian flour. The varieties Firbank, Federation, and Indian No. 40 are recommended. These varieties show less strength than the best American or Russian wheats. The Sudan climate shortens the growing period of wheats.—*L. R. Waldron.*

3700. May, R. G. **Sudan grass in the Bathurst district.** Agric. Gaz. New South Wales **34**: 33. 1923.—Proper rate of seeding Sudan grass has been found to be 10 pounds per acre in rows 14 inches apart.—*L. R. Waldron.*

3701. Mortifee, A. **Observations on Uba cane.** South African Sugar Jour. **7**: 34–45. 1923.—Certain factors make the Uba cane desirable for cultivation in Zululand. It is very hardy, resistant to drought in the higher lands and to floods on the Umfolozi flats, and has unusual ratooning qualities. A peculiarity of the variety is its production of "bull shoots," extremely vigorous and rapid growing shoots which usually appear 8–9 months after cutting. An abnormal increase in moisture causes an increase in the number of these shoots. They contain less sucrose than the plant cane.—*C. Rumbold.*

3702. Nolte, O. **Beiträge zur Kenntnis der Ernährung der Schmetterlingsblütler. [Contribution to the knowledge of the nutrition of legumes.]** Mitteil. Deutsch. Landw. Ges. **38**: 78–80. 1923.—Varying quantities of nitrogenous fertilizer, mostly sulphate of ammonia, were applied to lupine, serradella, beans, peas, red clover and lucerne. No effect was noted on the 1st 3, but with the last 3 there were some increases. Increases were most pronounced with urea.—*A. J. Pieters.*

3703. O'Kelly, J. F., and Rowland Cowart. **Cotton experiments, 1922.** Mississippi Agric. Exp. Sta. Circ. 45. *8 p.* 1922.—Results are given of standard and new varieties grown on valley, hill, and wilt-infected soil. The average values of the increase for 2 years due to the application of 15 pounds available nitrogen per acre from different carriers are reported as $12.82 for ammonium sulphate, $12.67 for nitrate of soda, $9.95 for calcium cyanamid, and $1.60 for cottonseed meal.—*J. F. O'Kelly.*

3704. O'Kelly, J. F., and Rowland Cowart. **Corn experiments, 1922.** Mississippi Agric. Exp. Sta. Circ. 47. *8 p.* 1923.—Comparative yields of standard and new corn varieties on valley and hill soils and 3 years' results from the use of nitrates under corn are reported. The use of 15 and 30 pounds of available nitrogen per acre from ammonium sulphate, nitrate of soda, or calcium cyanamid was profitable only in seasons of ample rainfall.—*J. F. O'Kelly.*

3705. Opitz. **Versuche über Einwirkung starker Stickstoffdüngung auf den Anbauwert der Kartoffeln. [Investigations on the effect of heavy nitrogenous fertilizing on the propagating value of potatoes.]** Mitteil. Deutsch. Landw. Ges. **38**: 75–78. 1923.—Five varieties of potatoes were grown (1) on a reasonably fertile field, (2) with heavy excess of ammonium sulphate and nitrate of soda. In practically every case the seed stock from the field heavily fertilized gave smaller returns and showed more diseased hills.—*A. J. Pieters.*

3706. Patterson, T. H. **The northern gum lands.** New Zealand Jour. Agric. **25**: 321–333. *3 fig.* 1922.—Results to date indicate that these lands may be successfully and profitably farmed by proper methods. Drainage is often necessary and the land should then be limed. Deep cultivation must be practiced. The soil should not be too fine on top. Detailed data on the different experimental plots are given.—*N. J. Giddings.*

3707. Piper, Charles V., and William J. Morse. **The soybean.** *339 p., 84 fig.* McGraw-Hill Book Co., Inc.: New York & London, 1923.—The authors aim to present all facts now known about this important economic crop, and to emphasize its value as a human food. The soybean is discussed with relation to its commercial status, botanical history, agricultural history, culture, harvesting and storage, composition, utilization, varieties, structure of seed, oil content, soybean cake or meal, soybean products for human food, table dishes of soybeans and soybean products, and enemies. A bibliography of 600 titles is appended.—*Mary R. Burr.*

3708. Remh, Th. **Beobachtungen über Gaswasserdungüng. [Observations on fertilizing with gaswater.]** Mitteil. Deutsch. Landw. Ges. **38:** 106–108. 1923.—Gaswater containing 1.1–2.21 per cent nitrogen as ammonia was applied as top dressing to meadows and broadcasted on land in preparation for mangels. Except where the gaswater was considerably diluted an initial injury to the grass was noted, but this injury was overcome and the plots fertilized yielded increases amounting to about 75 per cent of those on check plots treated with ammonium sulphate. Gaswater is recommended, but only in the immediate vicinity of factories as the value of the fertilizer does not warrant high transportation costs.—*A. J. Pieters.*

3709. Samson, Harold W. **United States grades for potatoes.** U. S. Dept. Agric. Circ. 238. *4 p.* 1922.—Grading standards recommended by the Department of Agriculture and the U. S. Food Administration in 1917 with a few minor changes recommended in 1919 have proved so satisfactory that they are being generally adopted, and by many states as the official standard. Further slight revision is made by the adding of a U. S. No. 1 small grade. The 4 grades are fully described and included terms defined.—*P. L. Ricker.*

3710. Schneider. **Die Bewirtschaftung der Wiesen und Weiden unter Berücksichtigung der wirtschaftlichen Seite in Bezug auf Viehzucht und Viehhaltung. [The management of meadows and pastures considered economically with respect to cattle breeding and cattle raising.]** Mitteil. Deutsch. Landw. Ges. **38:** 117–118. 1923.—The price of hay in Germany has increased 5,–7,000 fold since 1913, but prices of potatoes and sugar beets have risen only 4–500 fold. This shows Germany's dependence upon imported feeds. The remedy is in better crops resulting from a careful study of meadows and pastures.—*A. J. Pieters.*

3711. Shattuck, Obil, and Douglas W. Ritchie. **Growing crops in Harney Valley.** Oregon. Agric. Exp. Sta. Bull. 191. *24 p., 15 fig.* 1922.—A discussion is given of methods of irrigation and crops adapted to this Oregon region. The different irrigation systems mentioned are: the "border system," "check system," "corrugation system," "furrow system," and "sub-irrigation."—Small cereals and forage crops such as alfalfa, field peas, clovers, and sunflowers do best. Potatoes and root crops can be grown but are not as reliable as cereals and forage crops.—*C. E. Owens.*

3712. Skuderna, A. W., and C. E. Mickel. **The report of experimental work and field observations in investigating and factors affecting the sugar content and purity of sugar beets. Season 1921.** *119 p.* [*mimeographed*], *illus.* American Beet Sugar Co.: Arkansas Valley, Colorado. 1922.—A résumé of the weather during 1921 is given and its effects on the crop. Effects are recorded of varying methods in cultivation especially fall plowing, rotation of crops, and thinning, on quality and yield of sugar beets. Analyses of soils, water and fertilizer experiments, sugar beet variety tests, experimental beet seed raising, and notes on treated seed follow. In 1921 there was a severe epidemic of leafspot (*Cercospora beticola*). The observations on this leafspot are connected with the different phases of the experimental work and form a commentary on the conditions which increased and diminished the virulence of the disease. There are observations on fungous diseases of minor importance, insect pests, and field losses prior to and after topping the beets and using different methods of ensiling the roots.—*C. Rumbold.*

3713. S[outh], F. W. **The eradication of sensitive plant, Mimosa pudica.** Malayan Agric. Jour. **10:** 237. 1923.—It is shown that spraying with sodium arsenite kills that part of the plant which is above ground but does not kill the root, which sprouts again.—*I. H. Burkill.*

3714. Stephens, D. E., and G. R. Hyslop. **Wheat growing after fallow in eastern Oregon.** Oregon Agric. Exp. Sta. Bull. 190. *35 p., 13 fig.* 1922.—Best practices as to preparation of the soil, seed treatment, time, rate and depth of seeding, cultivation, and best varieties are discussed.—*C. E. Owens.*

3715. Stiles, E. P. **The coast country and clover.** Beekeepers' Item 6: 45–46. 1922.—White clover (*Trifolium repens*) is spreading in the coast country of Texas, but it attracts very few honey bees. The soil of the upper Texas coast country is largely a heavy black clay and is often acid. If heavy liming would make it possible to grow white sweet clover (*Melilotus alba*), the value of the land would be greatly increased.—*J. H. Lovell.*

3716. Stoa, Theodore E. **Varietal trials with oats in North Dakota.** North Dakota Agric. Exp. Sta. Bull. 164. *46 p., 6 fig.* 1922.—Varietal trials with oats are reported for North Dakota from 7 localities covering periods varying from 2 to 21 years. Mid-season varieties are generally better adapted than either early or late varieties. In the southern portion, early varieties frequently do as well or better than mid-season varieties. Late varieties do well only in northeastern North Dakota. Sixty-day and Kherson are the leading early varieties; Lincoln, Victory, and Siberian are leading mid-season varieties; and White Russian and White Tartarian are the best late varieties. Differences among varieties within any group are not important. While yield of straw is closely associated with height of plant, this yield varies greatly from year to year. Early varieties mature in 75–80 days from emergence. Mid-season varieties require about 10, late varieties 20 additional days for maturity. Early variety oats generally weigh least per bushel. Under normal conditions, oats grown in western North Dakota weigh more than those grown in the eastern portion of the state. Swedish Select, a mid-season variety commonly grown, does not yield well and is rather susceptible to stem rust.—*L. R. Waldron.*

3717. Tesdorpf, A. **Oversigt. [Supervision.]** Tidsskr. Landokonomi 1922[12]: 567–577. 1922.—The report concerns the activities of the Danish agricultural Society from Oct., 1921, to Oct., 1922, particularly toward securing the enactment of agricultural legislation.—*Albert A. Hansen.*

3718. Tice, C. **Potato improvement work in B. C.** Agric. Jour. [British Columbia] 7: 272–273; 8: 11, 15. 1923.—The author deals chiefly with seed certification.—*J. W. Eastham.*

3719. Waldron, L. R., T. E. Stoa, and C. E. Mangels. **Kota wheat.** North Dakota Agric. Exp. Sta. Circ. 19. *10 p., 4 fig.* 1922.—Kota is a bearded, hard, red, spring wheat, resistant to stem rust. For periods of from 1 to 5 years at 7 points in North Dakota, Kota has outyielded Marquis 15.6 per cent. Comparative baking and milling data are given for Kota and Marquis wheats.—*L. R. Waldron.*

3720. Ward, F. E. **Cocksfoot seed production.** New Zealand Jour. Agric. 25: 18–19. *1 fig.* 1922.—A successful trial of the Danish system at Ashburton Experimental Farm is reported.—*N. J. Giddings.*

3721. Wenholz, H. **Varieties of maize in New South Wales.** Agric. Gaz. New South Wales 34: 27–33. *4 fig.* 1923.—The varieties Yellow Hogan, Manning Silvermine, Golden Superb, and Golden Glow are illustrated and the adaptation of the varieties is discussed with reference to different localities in New South Wales.—*L. R. Waldron.*

3722. Wester, P. J. **Adlay, a new grain plant from the Orient.** Jour. Heredity 13: 221–227. *6 fig.* 1922.—Adlay is the native Philippine name for Job's Tears (*Coix lachryma-jobi* L.). While primitive tribes in the Philippines have long used the plant for grain, the author was surprised at the prolificacy of some strains. Seed was taken to Manila, where yields of 3,230 pounds to the acre were obtained. Milling tests in Manila and Washington, D. C., have proved that the grain is adapted for use with modern machinery, and when mixed with ⅓ flour makes very acceptable bread. Since adlay yields fully as much as rice and does not require flooded paddies for culture, it is suggested that it may become an important tropical grain crop.—*R. C. Cook.*

3723. Whittet, J. N. **Kikuyu grass in bracken fern country.** Agric. Gaz. New South Wales 34: 24–26. *2 fig.* 1923.—When Kikuyu grass [*Pennisetum longistylum*] is planted at 3-foot intervals in drills plowed 3 feet apart in braken fern areas, it quite smothers out the fern. The grass resists frosts and affords valuable pasture.—*L. R. Waldron.*

3724. Whittet, J. N. **Winter grasses in the Penrith district.** Agric. Gaz. New South Wales 34: 103–104. *1 fig.* 1923.—Three plats were sown with various grass mixtures and legumes. *Avena elatior* was eaten with most avidity and *Phalaris bulbosa* ranked 1st in growth and frost resistance.—*L. R. Waldron.*

3725. Winkler, E. A. **Hubam as a farm crop.** Gleanings in Bee Culture 50: 762–763. *Fig. 1–2.* 1922.—The stalks and roots of the annual white sweet clover, or Hubam clover, are nearly as large as those of the biennial species. The roots of Hubam clover may exceed 6 feet in length. Sown broadcast this variety yields over 4 tons of dry matter per acre, which, if plowed under, is equal to nearly 80 tons of farm manure. It is said to save a year in crop rotation.—*J. H. Lovell.*

BIBLIOGRAPHY, BIOGRAPHY, AND HISTORY

C. W. Dodge, *Editor*

Charles A. Weatherby, *Assistant Editor*

(See also in this issue Entries 3669, 3707, 3807, 3808, 3813, 3949, 3965, 3970, 4045, 4051, 4056, 4098, 4184, 4231, 4373, 4494, 4619, 4627, 4647)

3726. Anonymous. **Agricultural research at Aberystwyth.** Nature 109: 795–796. 1922.—The new buildings of the Welsh plant-breeding station of the Agricultural Department, University College of Wales, were formally opened May 20, 1922. In addition to a capital grant and annual grants-in-aid it receives an endowment from Sir Laurence Phillips of £10,000 and an annual donation of £1,000 for 10 years. The grounds include 142 acres pasture and arable land, 28 acres woodland, and 5 of garden. Work will be directed to clovers, grasses, and oats, not to barley, potatoes, or rootcrops.—*O. A. Stevens.*

3727. Anonymous. **List of serials currently received in the Library of the U. S Department of Agriculture, exclusive of U. S. Government publications and publications of the State agricultural colleges and experiment stations, arranged by title, by subject, and by region.** U. S. Dept. Agric. Dept. Circ. 187. *358 p.* 1922.—The list of periodicals was prepared by Margaret T. Olcott, and the list of other serials by Emma B. Hawks.—*J. R. Schramm.*

3728. Baltz. **"Quoddam forestum . . . . positum in magetheida."** Zeitschr. Forst- u. Jagdw. 53: 564–573. 1921.—Probable meaning and modern equivalents of old Latin terms, such as forestum, forestes, nemus, magetheida, etc., are discussed.—Two groves of distorted forest trees are described on the Island of Sylt, off the coast of Friesia, the remnants of an extensive forest in ancient times, which was gradually exterminated by exposure to the powerful winds from the North Sea. North of Kampen the sand dunes are covered with an extensive plantation of *Pinus montana* and *P. uncinata* which is serving its purpose of holding the sand. The plantation is several decades old, but the trees barely appear above the dunes. The stems are prostrate and buried, the erect branches appearing as individual trees. —*J. Roeser.*

3729. Bassermann-Jordan, F. von. **Die Geschichte des Weinbaus. [The history of grape cultivation.]** Ber. Senckenberg. Naturf. Ges. Frankfurt a. M. 51: 36. 1921.—An abstract is given of a lecture on the history of grape cultivation in Europe. Although prehistoric remains of grape vines have been found, the opinion is expressed that the cultivation of the grape for wine may have been introduced from Asia. In any case it had become established

in France prior to the Roman occupation. Grape cultivation in Europe reached its highest development in the 15th century.—*A. W. Evans.*

3730. Bennett, F. [Rev. of: Sargeaunt, John. **The trees, shrubs, and plants of Virgil.** *149 p.* B. H. Blackwell: Oxford, 1920 (see Bot. Absts. 9, Entry 1080).] Rept. Bot. Soc. and Exchange Club British Isles **6**: 82–84. 1920 [1921].—[See also Bot. Absts. 11, Entry 2249.]

3731. Borza, Al. **Bibliographia botanica Romaniae. [Botanical bibliography of Rumania.]** Bul. Inform. Grăd. Bot. Muz. Bot. Univ. Cluj **1**: 41–54, 87–91. 1921; **2**: 62–64, 89–92. 1922.—This collection of all the botanical literature on Rumania, both domestic and foreign, published since 1914, includes both scientific and popular literature, and foreign publications which deal with the Rumanian flora.—*M. Tiesenhausen.*

3732. Bosch, Iman. G. J. van den. **In memoriam Salomon Koenen.** Cultura **35**: 33–35. *1 pl.* 1923.—S. Koenen, one of the principal agriculturists in the Netherlands, died Dec. 26, 1922. He studied in Wageningen, Netherlands, and afterward at the University of Jena. In 1906 he became professor at the College of Agriculture, Wageningen.—*J. C. Th. Uphof.*

3733. Bougault, J. **Emile Bourquelot, 1851–1921.** Bull. Trimest. Soc. Mycol. France **38**: 59–68. *Portrait.* 1922.—A short account is given of the life and works of the famous pharmacologist and student of the chemistry of the fungi. His investigations on the fungi were mostly biological and included: (1) nature of sugars, their transformation and distribution and (2) soluble hydrolyzing and oxidizing enzymes. A detailed biography is given in Jour. Pharm. et Chim., Dec. 1, 1921. A list of his mycological publications is given.—*D. S. Welch.*

3734. Bougault, J. **Victor Harlay, (1872–1922).** Bull. Trimest. Soc. Mycol. France **38**: 25–28. 1922.—This short biographical sketch is followed by a chronological list of 36 works.—*D. S. Welch.*

3735. British Museum. **Catalogue of books, manuscripts, maps, and drawings in the British Museum (Natural History) Vol. VI, Supplement A-1.** *4 to, 512 p.* With Addenda and Corrigenda Vols. I and II. A-Hooker. *48 p.* Oxford University Press American Branch: New York, 1922. *$22.00.*

3736. Brockman-Jerosch, [H.] **Die erste Nahrung des Menschen Geschlechts. [The first food of the human race.]** Ber. Senckenberg. Naturf. Ges. Frankfurt a. M. **50**: 166. 1920.—A short discussion is given of the foods, especially vegetable, of the primitive Europeans. Most of the plants now cultivated are of recent introduction and the primitive races derived their vegetable food almost exclusively from wild indigenous plants. The most important of these was the oak, the acorn-meal of which is still used as food in the Mediterranean region and by the Indians.—*A. W. Evans.*

3737. Burnat, Emile. **Autobiographie publié avec une étude sur le botaniste et son oeuvre, des souvenirs et documents diverses par John Briquet . . . et François Cavillier. [Autobiography published with a study of the botanist and his work, reminiscences and various documents by John Briquet and François Cavillier.]** *185 p.* Conservatoire botanique: Geneva, 1922.—Burnat was born at Vevey, Oct. 21, 1828. He was educated at Geneva and Paris as an engineer and engaged in industrial work at Mulhouse (Mulhausen), Alsace, 1851–1870. He then retired and settled at Nant, devoting himself to the study of the flora of the Maritime Alps until his death in 1920. August Gremli, J.-J. Vetter, M. A. Tonduz, L. Favrat, Emile Samuel Abrezol, Louise Jordan, François Cavillier, and John Briquet were associated with him in this enterprise. Some biographical information is given on each of the above. His herbarium was given to the city of Geneva.—The autobiography is followed by further biographical

data and reminiscences by John Briquet and François Cavillier. A bibliography of 184 titles of Burnat's publications, lists of species named in his honor, of collecting trips, of visitors and correspondents, a summary of collections in his herbarium, are followed by reprints of 3 of his speeches. Eulogies by P. Bornaud, E. Wilczek, C. de Lacroix, Kopp, Daniel Mieg, and a list of biographical notices, are appended.—*C. W. Dodge.*

3738. Carrier, Lyman. **The beginnings of agriculture in America.** *xvii + 323 p., 30 fig.* McGraw Hill Book Co. Inc.: New York & London, 1923.—The work touches briefly the theory of evolution, effect of environment on species, determination of plant history, origin of food plants, similarity of plants in the old and new worlds, primitive agriculture, plant culture as a start toward civilization, domestication of animals, early civilization in dry climates, accumulation of wealth and related topics. A chapter each is devoted to old world agriculture, American Indians, natural vegetation in America, Indian agriculture and a full discussion of Indian crops, Indian products and practices. The history of the exploration period and English Colonial settlements is told in detail, followed by the Pilgrim period and the story of the settlement of New York and New Jersey under the Dutch West India Co. Separate chapters give the history of Maryland, Delaware and Pennsylvania, Connecticut and Rhode Island, North and South Carolina and Georgia. French settlements and influence, colonial expansion, introduction of European crops, introduction of domestic animals, farm implements and the use of fertilizers, slavery, the effect of colonial commerce on agriculture, and the influence of the manufacture of alcoholic beverages on colonial agriculture. The closing chapter tells the history of relations with Great Britain. A valuable bibliography is appended.—*Mary R. Burr.*

3739. [Druce, G. C.] [**Frederick Arnold Lees.**] Rept. Bot. Soc. and Exchange Club British Isles **6:** 358–361. 1921 [1922].

3740. Druce, G. C. **Obituaries.** Rept. Bot. Soc. and Exchange Club British Isles **6:** 93–108. 1920 [1921].—Notices are included of John Gilbert Baker, 1834–1920; A. Montgomerie Bell, 1845–1920; Reginald Farrer, 1880–1920; and Wm. Moyle Rogers, 1835–1920.—*G. C. Druce.*

3741. Druce, G. C. [**Thomas Carew Hunt and his herbarium.**] Rept. Bot. Soc. and Exchange Club British Isles **6:** 454–456. 1921 [1922].

3742. [Druce, G. C.] [**William Whitwell.**] Rept. Bot. Soc. and Exchange Club British Isles **6:** 367–369. 1921 [1922].

3743. East, E. M. **Mendel and his contemporaries.** Sci. Monthly **16:** 225–237. 1923.—Mendel developed a method, but the biologists of his day were not ready for such a change. When Weissmann's theory needed testing, Mendel's long-forgotten paper was brought to light, furnishing the necessary method, and genetics entered upon a new era.—*L. Pace.*

3744. Eberle, E. G. **Frederick Belding Power.** Jour. Amer. Pharm. Assoc. **11:** 403–405. *Portrait.* 1922.—In 1914 Frederick Belding Power resigned as Director of the Chemical Research Laboratories of the Burroughs Wellcome Co., London, to accept a position in the Phytochemical Laboratory, Bureau of Chemistry, Washington, D. C.—*Anton Hogstad, Jr.*

3745. Fairchild, David. **Alexander Graham Bell.** Jour. Heredity **13:** 195–200. *1 fig.* 1922.—This account of the life of Dr. Bell describes especially his studies in genetics and eugenics. He spent many years in developing a strain of twin-bearing, multiple-nippled sheep, and his efforts had been only partly successful at the time of his death. His principal eugenic studies related to the inheritance of deafness, and to the inheritance of longevity in the Hyde family.—*R. C. Cook.*

3746. Fitting, Hans. **Herman Vöchting.** Ber. Deutsch Bot. Ges. 37: (41)–(77). *Pl. 1.* 1919.—This article gives an extensive sketch of the life and work, together with a portrait and bibliography, of this German botanist (1847–1917).—*W. C. Muenscher.*

3747. Funk, Georg. **Zur Geschichte botanischer Forschung an der zoologischen Station zu Neapel 1872–1922.** [History of botanical research at the Zoological station at Naples, 1872–1922.] Ber. Deutsch. Bot. Ges. 40: 221–241. 1922.—This paper gives an extensive sketch of the history of the zoological station at Naples, especially of the botanical research work done there. The station was founded by Anton Dohrn in 1872. The author discusses the development of the laboratories, herbarium, equipment, etc. During the last 50 years botanists have worked at Naples upon general botanical problems as well as on marine algae. A bibliography of botanical work from this station is given.—*W. C. Muenscher.*

3748. Guffroy, Ch. **Léon Roussel.** Bull. Trimest. Soc. Mycol. France 38: 69–70. 1922.—This agricultural engineer, a student of the fungi, died March 11, 1916, from wounds received at Verdun. He was cited for exceptional bravery and received the Cross of the Legion of Honor. He was chiefly interested in agriculture and his work as director of an agricultural society took him to Spain in 1904. He published several popular works on edible and poisonous fungi.—*D. S. Welch.*

3749. Haberlandt, G. **Zur Geschichte der physiologischen Pflanzenanatomie.** [History of physiological plant anatomy.] Ber. Deutsch. Bot. Ges. 40: 156–160. 1922.—This criticism was prompted by remarks appearing in the historical introduction to Zelle und Cytoplasma by H. Lundegarth, appearing in the first part of K. Linsbauer's Handbuch der Pflanzenanatomie in which Sachs, Schwendener, and Haberlandt are referred to as the founders of physiological plant anatomy. The author points out that physiological plant anatomy is as old as plant anatomy itself. In the 17th century Malpighi and Grew and their followers endeavored to explain, upon a functional basis, the anatomical structures which they discovered. During the first half of the 19th century Mohl, Unger, Schleiden and Nägeli were interested primarily in pure descriptive anatomy. Sachs also belonged to this school. In his earlier works Sachs did not mention function in his definition of tissues. The appearance in 1874 of Schwendener's Das Mechanische Prinzip im Anatomischen Bau der Monokotylen, is regarded as the rebirth of physiological plant anatomy. Lundegarth fails to mention or cite this work. After the appearance of this work, in 1877, Haberlandt went to Tübingen to study with Schwendener. Only after the appearance of Haberlandt's contributions of 1879 and 1881 did Sachs modify his views of tissues. A study of the literature cited does not justify placing the name of Sachs among the founders of physiological plant anatomy.—*W. C. Muenscher.*

3750. Harris, J. Arthur. **Galton and Mendel: their contribution to genetics and their influence on biology.** Sci. Monthly 16: 247–268. 1923.

3751. Haskell, R. J. **The fourth annual summer field meeting of the American Phytopathological Society.** Phytopathology 13: 150–152. 1923.—A report is given of the meeting held Aug. 29 to Sep. 1, 1922, in the trucking districts of Delaware, New Jersey, and Pennsylvania.—*B. B. Higgins.*

3752. Henry, A. **The Dublin Arboricultural Society.** Gardeners' Chron. 70: 196. 1921.—This society, probably founded in 1830, is the oldest society of its kind in the British Isles. It published its only volume, Transactions Arboricultural Society, in 1831. No further reference to the society has been found.—*C. W. Dodge.*

3753. Hill, T. G. **Index to the Annals of Botany. Vols. XXI–XXX. (1907–1916).** *8vo, 40 p.* American Branch Oxford University Press: New York. 1922.

3754. Husnot, T. **Fernand Camus.** Rev. Bryologique **49**: 67, 68. 1922.—Camus was born at Chodat, France, in 1852 and was educated as a physician, obtaining his degree in 1880. Soon afterwards, however, he became associated with the division of cryptogamic botany in the Natural History Museum at Paris and retained his position there until his death [in 1922]. He was particularly interested in the bryophytes and published numerous papers dealing with the mosses and hepatics of France.—*A. W. Evans.*

3755. [Husnot, T.] **George-Alfred Holt 1852–1921.** Rev. Bryologique **49**: 16. 1922.—Holt was born at Douglas on the Isle of Man, England, and died at Sale, Cheshire. Although a chemist by profession he was a diligent student of bryology and discovered many rare species of mosses and hepatics in various parts of the British Isles.—*A. W. Evans.*

3756. J[ackson], B. D. **Early British botanists.** [Rev. of: Gunther, R. T. **Early British botanists and their gardens, based on unpublished writings of Goodyer, Tradescant and others.** *viii + 417 p.* University Press: Oxford, 1922.] Nature **109**: 806–807. 1922.

3757. Kaempffert, Waldemar. **An Indian master-mind in science.** Asia **23**: 173–176, 219. *4 fig.* 1923.—A popular presentation of the work of J. C. Bose is given.—*C. W. Dodge.*

3758. Kearney, Thomas H. **Louis Trabut, botanist and plant breeder.** Jour. Heredity **13**: 153–160. *5 fig.* 1922.—The author summarizes the work of Dr. Trabut, Government Botanist of Algeria, in plant introduction and plant breeding, with especial reference to his cooperation with U. S. Department of Agriculture in introducing numerous valuable plants of French North Africa into the U. S. A.—*T. H. Kearney.*

3759. Kniep, Hans. **Ernst Stahl.** Ber. Deutsch. Bot. Ges. **37**: (85)–(104). *Pl. 1.* 1919.—An extensive sketch is given of the life and work of this German botanist (1848–1919). A portrait and bibliography are included.—*W. C. Muenscher.*

3760. Knoblauch, A. **Verzeichnis der Stifter. [List of the founders.]** Ber. Senckenberg. Naturf. Ges. Frankfurt a. M. **48**: 35–64. 1918.—The present compilation gives biographical notices of the 32 founders of the Senckenberg natural history society of Frankfort on the Main. Of these the following 5 were interested in botany: Johannes Becker, Georg Wilhelm Freireiss, Louis Daniel Jassoy, Johann Friedrich Metzler, and Johann Kaspar Stein. Becker was born at Speyer in 1769 and died at Frankfort in 1833; he was a student of the local flora and played an active part in the establishment of the botanical garden and museum. Freireiss was born at Frankfort in 1789 and died at Leopoldina, Brazil, in 1825; in 1824 he published a description of that country in which he included an account of the vegetation. Jassoy was born at Hanau in 1768 and died at Frankfort in 1831; he established a botanical garden that won the warm admiration of Goethe. Metzler was born at Frankfort in 1749 and died at Offenbach in 1825; his garden, also, attracted the attention of Goethe. Stein was born at Gemmingen in Würtemberg in 1776 and died at Frankfort in 1834; he made a rich collection of plants in the vicinity of the city and incorporated it in the herbarium of the museum.—*A. W. Evans.*

3761. Larsen, Th., og Carl Mariboe. **Oversigt over fremmed Litteratur. [Review of foreign literature.]** Tidsskr. Planteavl **28**: 615–642. 1922.—This is a systematic list of references to recent European and American literature on agricultural subjects with a section devoted to garden literature.—*Albert A. Hansen.*

3762. Lehman, Franz. **Alfred Koch.** Jour. Landw. **70**: 217–220. 1922.—An obituary.—*F. M. Schertz.*

3763. Leijs, J. J. **Kolonisatie van Suriname door Nederlandsche Landbouwers. [Colonization of Surinam by Dutch agriculturists.]** West Indië **4**: 47. 1919.—A history of the custom

methods of working, and present condition of colonization by Dutch agriculturists in Surinam is given.—*J. C. Th. Uphof.*

3764. Linné, Carl von. **Bref och skrifvelser af och till Carl von Linne med understöd af Svenska Staten utgifna af Uppsala Universitet. Forsta afdelningen, Del 8: Bref till och fran Svenska Enskilda personer Kalm—Laxman. Utgifna och med upplysande noter forsedds af J. M. Hulth.** [Letters and correspondence of and to Carl von Linné published by the University of Uppsala with a grant from the Swedish state. 1st section, part 8: Letters to and from private persons in Sweden, Kalm and Laxman, edited with instructive historical notes by J. M. Hulth.] *v + 200 p.* A. B. Akademiska Bokhandeln: Uppsala, 1922. *6 kroner.*—This part contains a large amount of correspondence of Pehr Kalm (1716–1779) and also that of Johan Olof Kalmeter (1746–1776), Georg von Kjörning (1743–1792), Johan Mauritz Klinckowström (1692–1768), Mårten Kähler (1728–1773), Magnus Lagerström (1691–1759), and Erik Laxman (1737–1796).—*C. W. Dodge.*

3765. Macoun, John. **Autobiography of John Macoun, M. A. [1831–1920.] Canadian explorer and naturalist, assistant director and naturalist to the Geological Survey of Canada.** *x + 305 p., 3portraits, 5 pl.* Field-Naturalists' Club: Ottawa, 1922.—This memorial volume contains a brief introduction by Ernest Thompson Seton. Macoun was born Apr. 17, 1831, in Maralin, County Down, Ireland. He emigrated with his family to Ontario, Canada, in 1850 where he worked as a farm hand and school teacher. After a brief normal training in Toronto he became professor of natural history at Albert College and in 1879 joined the staff of the Geological Survey ot Canada. He spent many years on exploring parties in connection with the first Canadian transcontinental railway lines and later visited other parts of Canada. His autobiography ends abruptly in 1904 and the final chapter, written by his son, W. T. Macoun, describes very briefly his declining years, which he spent in Sidney, British Columbia, where he died July 18, 1920. There follows a list of species named in his honor. The work is filled with interesting incidents of his botanical explorations but contains no index.—*C. W. Dodge.*

3766. Matisse, G. **Le mouvement scientifique contemporain en France. 1. Les sciences naturelles. [The contemporary scientific movement in France. 1. Natural sciences.]** (Collection Payot 10.) *160 p.* Payot & Cie.: Paris, 1921. *4 francs.*—After a detailed discussion of the foundation of marine laboratories of experimental zoology, the development of animal embryology, and theories of the adaptation of the organism to its environment, the author briefly sketches the work of Gustave Chauveaud on the embryogeny of plants, of Marin Molliard on plant physiology, and of L. Matruchot on the cultivation of fungi.—*C. W. Dodge.*

3767. Möbius, M. **Die Frankfurter Floristen. Zur Erinnerung an Martin Dürer. [The floristic botanists of Frankfort. In commemoration of Martin Dürer.]** Ber. Senckenberg. Naturf. Ges. Frankfurt a. M. 51: 154–166. 1921.—The author gives short biographical notices of numerous botanists, as a result of whose activities several local floras of Frankfort have been written, some of which are still in manuscript. The oldest to be published was the Flora Moeno-Francofurtana of J. J. Reichard, the 2 parts of which appeared in 1772 and 1778. Another important local flora was published in 1828 by J. Becker [see Bot. Absts. 12, Entry 3760] and bears the title, Flora der Gegend um Frankfurt a. M. A 3rd, by G. Fresenius, dated 1832, was the Taschenbuch zum Gebrauch auf Botanischen Excursionen in der Umgegend von Frankfurt a. M. These published floras, as well as those still unpublished, are fully described, and a list of more general works dealing incidentally with the region about Frankfort is appended. Martin Dürer, in whose commemoration the paper was prepared, was, in the opinion of the author, the botanist best fitted to prepare a new local flora, but unfortunately he failed to bring a work of this character to completion. He was born at Frankfort in 1842 and died there in 1921. Although an apothecary by profession he was greatly interested in plants and, after his retirement in 1879, devoted himself almost wholly to his botanical studies.—*A. W. Evans.*

3768. Molliard, M. **Discours prononcé aux obsèques de M. Gaston Bonnier.** [Discourse presented at the funeral of M. Gaston Bonnier.] Rev. Gen. Bot. **35**: 1–5. 1923.—The life of M. Gaston Bonnier is reviewed and tribute paid to his work and personality.—*J. C. Gilman.*

3769. M[u]r[e]t, E. **Le centenaire d'Elias Landolt.** [Centenary of Elias Landolt.] Jour. Forest. Suisse **72**: 221–223. *1 pl.* 1921.—The article is a résumé of the life work of Elias Landolt, the father of Swiss forestry, the creator of a Swiss practice of silviculture, the initiator of federal forest legislation, the teacher in forestry for 38 years under whom all Swiss foresters were trained.—*G. Kempff.*

3770. Pabisch, H. **O. Tunmann.** Ber. Deutsch. Bot. Ges. **37**: (77)–(84). 1919.—A brief sketch of the life and work of this Austrian pharmacologist (1867–1919) is given together with a bibliography.—*W. C. Muenscher.*

3771. Popenoe, Paul. **Dr. Fenzi's contributions to American horticulture.** Jour. Heredity **13**: 215–220. *2 fig.* 1922.—An account is presented of the life and work of E. O. Fenzi, born in Florence, Italy, 1843, who was awarded the third Meyer medal for distinguished service in plant introduction. He moved to California in 1893. Among the foreign plants brought by him to the U. S. A. are: *Lippia repens, Feijoa sellowiana, Vitis capensis, Buddleia madagascariensis, Lyonothamnus floribundus* var. *asplenifolius, Taxodium mucronatum, Asparagus scandens* var. *deflexus*, and *Acacia podalyriaefolia.* In 1913 he returned to Italy and has since been active in plant introduction work in Libya, Italy's North African colony.—*R. C. Cook.*

3772. Porterfield, W. M., Jr. **References to the algae in the Chinese classics.** Bull. Torrey Bot. Club **49**: 297–300. *Fig. 1.* 1922.—The Chinese character for Algae is Tsao, which appeared in very early times. Judging from the references in ancient Chinese literature and from an "analysis of the ideograph, there is a possibility, if not a probability, that the knowledge of the algae as a distinct morphological unit in the plant kingdom dates back to very early times."—*P. A. Munz.*

3773. Prain, David. **Robert Allen Rolfe.** Rept. Bot. Soc. and Exchange Club British Isles **6**: 365–367. 1921 [1922].

3774. R., A. B. [William Carruthers.] Nature **109**: 787–788. 1922.—William Carruthers was born in 1830 at Moffat, Dumfries, and died June 2, 1922. He was educated for the ministry at Edinburgh. Appointed in 1859 as assistant to J. J. Bennett, who recently had succeeded Robert Brown as Keeper of the Department of Botany at the British Museum, Carruthers succeeded Bennett in 1871 and his work there until 1894 showed great development [see Journal of Botany, 1895]. He was prominent in the Linnean, Royal, and other scientific societies. As consulting botanist to the Royal Agricultural Society from 1871 to 1910 he made many contributions to diseases of crops, pasture grasses, and to seed testing. His chief contributions to pure science were in paleobotany, notably his monograph on fossil Cycadean stems of the Secondary Rocks of Britain [Trans. Linn. Soc. 1870].—*O. A. Stevens.*

3775. Rea, Carleton. **William Beriah Allen, (1875–1922).** Trans. British Mycol. Soc. **8**: 191–192. 1923.—William Beriah Allen of Benthall, Shropshire, was a potter by profession but he became at the same time an eminent mycologist and made several interesting discoveries and numerous additions to the British fungus flora.—*W. B. McDougall.*

3776. Römer, Iulius. **Schimbul meu de scrisori cu Florian Porcius.** [My correspondence with Florian Porcius.] Bul. Inform. Grăd. Bot. Muz. Bot. Univ. Cluj **1**: 57–63. 1921.—These reminiscences of the Transylvanian botanist give notes on interesting plants of Rumania.—*Al. Borza.*

3777. Roper, Ida M. [Cedric Bucknall.] Rept. Bot. Soc. and Exchange Club British Isles 6: 355–356. 1921 [1922].

3778. Savage, S. **A little known Bohemian herbal.** Library 2: 116–131. *4 fig., 2 portraits* 1921.—The Bohemian edition of P. A. Mattioli, translated by Tradeáš Hájek z Hajku and printed at Prag in 1562 by Georgius Melantrichus ab Aventino, is the first in which the large woodcuts of the later editions were used. The collation and notes on the translator and printer are followed by a discussion of signatures of the engravers, which were effaced before the blocks were used for the German and Venice editions. Six of the woodcuts, 3 being of plants, are reproduced. The blocks were used repeatedly to illustrate herbals, being found in Duhamel du Monceau, Traité des Arbres et Arbustes qui se Cultivent en France en Pleine Terre, where it is stated that the original blocks were used.—*C. W. Dodge.*

3779. Schonland, S. **South African botanical literature.** Bot. Surv. South Africa Mem. 4. *69–85.* 1922.—This includes an enumeration of the principal works on systematic botany, economic botany, plant pathology, South African phytogeography, ecology of South African plants, and fossil plants.—*E. M. Doidge.*

3780. Shull, George H. **A permanent memorial to Galton and Mendel.** Sci. Monthly 16: 263–268. 1923.—The plan proposes to use the income from a permanent fund to illustrate such research papers in Genetics as need colored plates.—*L. Pace.*

3781. Smith, Erwin F. **Pasteur, the man (Dec. 27, 1822–Sept. 28, 1895).** Sci. Monthly 16: 269–279. 1923.—Such facts of his ancestry and youth as present his characteristics and his broad field of work are given in this appreciation of Pasteur.—*L. Pace.*

3782. Smith, W. G. **Botany in the twentieth century.** Pharm. Jour. 107: 473–476. 1922. —The address includes the following headings: Beginnings of plant chemistry and physiology; life in the soil; bacteroids; nitrification mycorhiza; the relation of the plant to the soil; the plant-cell; metabolism; plant-breeding; selection and hybridization; diseases in plants; the treatment of plant diseases; immune varieties; recent botanical progress.—*E. N. Gathercoal.*

3783. Strand, E. [Rev. of: Bryk, F. **Linneaus im Auslande. (Linnaeus abroad.)** *33 p., 3 pl.* Stockholm, 1921.] Arch. Naturgesch. Abt. 88: 167, 168. 1922.

3784. Tubeuf. [Rev. of: Morstatt, H. **Bibliographie der Pflanzenschutzliteratur für 1914–1919. (Bibliography of plant protection literature.)** *viii + 463 p.* Biologische Reichsanstalt für Land- u. Forstwiss.: Berlin-Dahlem, 1921 (see Bot. Absts. 11, Entry 4543).] Forstwiss. Centralbl. 45: 38. 1923.—Four points are suggested for making such bibliographies more useful to German scientists: (1) the literature should be more carefully selected, and unimportant material omitted; (2) the important foreign literature should be covered by good abstracts; (3) for the easily accessible German material only the general scope should be noted and (4) the libraries in which the literature may be consulted should be indicated.—*W. N. Sparhawk.*

3785. Tucker, Ethelyn M. **Incunabula in the library of the Arnold Arboretum.** Jour. Arnold Arboretum 4: 56–60. 1923.—The incunabula of the Arnold Arboretum library numbering 17, are briefly described; some of the works are very rare and no other copies are known in this country.—*Alfred Rehder.*

BOTANICAL EDUCATION

C. Stuart Gager, *Editor*

Arthur H. Graves, *Assistant Editor*

(See also in this issue Entries 3730, 3738, 3747, 3749, 3750, 3781, 3782, 3969, 4041, 4411, 4415, 4453, 4454, 4455, 4619, 4715)

3786. Bonnier, G., et Leclerc du Sablon. **Cours de botanique.** [Textbook of botany.] Fasc. IV (2nd part) and Fasc. V (1st and 2nd part). *8vo, 527 p., 1210 fig.* Librairie générale de l'Enseignement: Paris [no date].

3787. Burlingame, L. L., H. Heath, E. Martin, and G. L. Peirce. **General biology.** *xxix + 569 p.* H. Holt & Co.: New York. 1923.

3788. Clute, Willard N. **Botany for beginners—V.** Amer. Bot. 29: 7–11. 1923.

3789. Clute, Willard N. **Plant names and their meanings—XIV. Scrophulariaceae.** Amer. Bot. 29: 18–23. 1923.

3790. Druce, G. C. [Rev. of: Bevis, J. F., and H. J. Jeffery. **British plants; their biology and ecology.** *2nd ed., vi + 346 p.* Methuen & Co.: London, 1920.] Rept. Bot. Soc. and Exchange Club British Isles 6: 59–61. 1920 [1921].—[See also Bot. Absts. 9, Entries 672, 676; 11, Entry 1103.]

3791. Druce, G. C. [Rev. of: Small, James. **Text-book for medical and pharmaceutical students.** *681 p., 1350 fig.* J. A. Churchill: London, 1921.] Rept. Bot. Soc. and Exchange Club British Isles 6: 351–352. 1921 [1922].—[See also Bot. Absts. 10, Entry 1602; 11, Entry 111.]

3792. Foster, Roy L. **Fact and fiction about evolution.** *3 + 74 p.* The Stratford Co.: Boston, 1923.

3793. [Giltner, Ward.] **Laboratory manual in general microbiology.** *2nd ed., xxii + 472 p., 79 illus.* John Wiley & Sons, Inc.: New York, 1921.—This manual has been "prepared by the Laboratory of Bacteriology and Hygiene, Michigan Agricultural College." In this edition the use of Fuller's scale has been abandoned, the sections dealing with soil and water and sewage bacteriology have been largely rewritten, and alterations and additions have been made to the section on pathogenic bacteriology and notably to the Appendix. Part I, General morphological and cultural methods; Part II, Physiology of microorganisms; PartIII, Applied microbiology, including (1) microbiology of air, water and sewage, soils, dairy practice, plants, (2) animal diseases and immunity; (3) appendix.—*C. S. Gager.*

3794. Giltay, E. **Pflanzenphysiologische demonstrationen.** [Plant physiological demonstrations.] Mededeel. Landbouwhoogeschool Wageningen 22^2: 1–14. *3 pl., 3 fig.* 1922.—Laboratory methods are presented on (1) the function of the seedcoat; (2) demonstrating before large audiences the weight of curving root tips; (3) closing of stoma during killing of the guard cells; (4) absorption spectrum of chlorophyll; (5) plasma movements of *Tradescantia.*—*J. C. Th. Uphof.*

3795. Gisevius, P. **Illustriertes landwirtschafts-Lexikon.** [Illustrated agricultural lexicon.] *5th ed.* With the collaboration of Elizabeth Böhm, W. Borgmann, and others. *2 vol. Illus.* P. Parey: Berlin, 1920.

3796. International Correspondence Schools, [Scranton, Pennsylvania.] **The farm and garden handbook. For all persons interested in general farming, fruit culture,**

truck farming, market gardening, live stock production, bee keeping, dairying, etc. *xviii* + *429 p., illus.* International Textbook Co.: Scranton, Pennsylvania, 1922.

3797. Jordan, E. O. A text-book of general bacteriology. *7th ed., 744 p.* W. B. Saunders Co., Ltd.: Philadelphia and London, 1922.—In this edition the chapters on influenza, anaerobes, and methods of studying bacteria have been entirely rewritten, and the chapters on Streptococci, Pneumococci, and typhus fever extensively revised. Important additions have been made among others, to the sections on immunity and yellow fever.—*C. S. Gager.*

3798. Karraker, P. E. Report on the progress in standardizing the elementary college course in soils. Jour. Amer. Soc. Agron. 15: 25–28. 1923.

3799. Kern, O. J. Outlines of course of instruction in agricultural nature study for the rural schools of California. California Agric. Exp. Sta. [Unnumbered Bull.] *106 p.* 1923.—Suggestive material for the use of teachers in the elementary schools in California is presented. The material is grouped under 4 general topics: Human needs, interests and activities; plant life throughout the year; animal life throughout the year; natural phenomena and the inorganic world and soil studies.—*A. R. C. Haas.*

3800. Mahin, Edward G., and Ralph H. Carr. Quantitative agricultural analysis. *xiii* + *329 p., 62 fig.* McGraw-Hill Book Co., Inc.: New York. 1923.—International Chemical Series.—The book is prepared with the conviction of the authors that "one of the things most needed by scientific agriculture today is an increasing body of agricultural chemists who understand the importance of desiring to know *why* matters are thus and so," and that "the scientific development of fundamentals" must be included with instruction in "the mechanical notions and processes of chemistry." Part I, general analysis, includes: theory and general principles, general operations, quantitative determinations. Part II, special measurements, includes: density and specific gravity, heat of combustion (calorimetry), index of refraction, optical rotation (polarimetry), hydrogen-ion concentration. Part III, analysis of agricultural materials, includes: feeds, saponifiable oils, fats and waxes, dairy products, soils, fertilizers insecticides and fungicides, table of logarithms and antilogarithms, table of atomic weights.—*C. S. Gager.*

3801. Mathews, F. Schuyler. The book of wild flowers for young people. *xvi* + *397 p., illus.* G. P. Putnam's Sons: New York and London, 1923.

3802. Moon, Truman Jesse. Laboratory manual, biology for beginners. *191 p., 23 pl.* H. Holt and Co.: New York, 1922.

3803. Mukerji, N. G. Handbook of Indian agriculture. *4th ed., 622 p.* Thacker, Spink & Co.: Calcutta; W. Thacker & Co.: London, 1923.

3804. Orticoni, A., et R. Clogne. Pratique bactériologique. [Bacteriological practice.] *489 p., 2 pl. (col.), 110 fig.* Le Francois: Paris, [n. d.]

3805. Pace, Lula. A few Texas plants. Baylor Univ. Bull. 25^{5-6}: 1–60. *Fig. 1–83.* 1923.—This is a popular presentation of some of the commonest plants, for teachers in nature study courses and for boys and girls of the grades.—*L. Pace.*

3806. Parks, H. B. What's in a name? Amer. Bee Jour. 62: 323–324. 1922.—The origin of common names of plants is briefly discussed.—*J. H. Lovell.*

3807. Reed, G. M. Louis Pasteur. Brooklyn Bot. Gard. Leaflets 11^{3-4}. *8p.* 1923.—This is a brief popular account of Pasteur's life and work, issued in connection with the Pasteur-Mendel program at the Brooklyn Botanic Garden, April 19, 1923.—*A. H. Graves.*

3808. Reppert, R. R. **Cartoons in agricultural teaching.** [Abstract.] Phytopathology 13: 33. 1923.

3809. Tansley, A. G. **Elements of plant biology.** *15 + 410 p., 63 fig.* G. Allen and Unwin: London; Dodd, Mead and Co.: New York, 1922.—This book is intended for medical students and others who may not continue the study of botany, but who desire or are obliged to obtain some elementary knowledge of plants, particularly in relation to general biology. After an introductory chapter on plants and animals, chapters 2–8 deal with organic substances, protoplasm and the cell; chapters 9–11 with bacteria and fungi. Chapters follow on the origin of sex and of the soma, the differentiation of tissues, life histories of bryophytes, pteridophytes and seed plants. The last chapters are devoted to the tissues and vegetative and reproductive organs of the seed plants.—*A. H. Graves.*

3810. Trafton, Gilbert H. **Biology of home and community: a textbook for high schools.** *x + 614 p., illus.* Macmillan Co.: New York, 1923.

3811. True, A. C. **Education and research in agriculture and home economics in the United States. Supplementing exhibit of the States Relations Service, U. S. Department of Agriculture at the Brazil centennial exposition, Rio de Janeiro, Brazil, 1922–1923.** *45 p. illus.* Government Printing Office: Washington, 1922.

3812. Viljoen, W. J. [Chairman]. **Report of the committee on agricultural education.** *54 p.* Cape Times Ltd., Government Printers: Cape Town, South Africa, 1922.

3813. White, Orland E. **Gregor Mendel, pioneer investigator of the laws of heredity.** Brooklyn Bot. Gard. Leaflets 11[1]. 4 p 1923.—This is a brief popular account of Mendel's life and work, issued in connection with the Pasteur-Mendel program at the Brooklyn Botanic Garden, April 19, 1923.—*A. H. Graves.*

CYTOLOGY

Gilbert M. Smith, *Editor*

(See in this issue Entries 3793, 4023, 4151, 4152, 4183, 4220, 4221, 4232, 4260, 4525, 4574)

ECOLOGY AND PLANT GEOGRAPHY

Forrest Shreve, *Acting Editor*

(See also in this issue Entries 3668, 3715, 3728, 3779, 3790, 3901, 3924, 3978, 4119, 4142, 4150, 4162, 4172, 4216, 4222, 4229, 4466, 4469, 4552, 4558, 4559, 4560, 4561, 4562, 4563, 4571, 4575, 4585, 4587, 4618, 4619, 4630, 4681)

GENERAL, FACTORS, MEASUREMENTS

3814. Allen, W. E. **Studies on catches of marine phytoplankton made by aid of the Kofoid bucket in 1921.** Ecology 4: 74–80. 1923.—A general report is presented on work done by members of the staff of Scripps Institution. The studies, confined to diatoms and dinoflagellates (the diatoms being the most numerous) indicate a lack of knowledge of the relative fertility of different levels of the ocean depths. The same may be said with reference to the influence of temperature and other environmental factors. Maximum diatom production occurs near the summer solstice because of increase in light and temperature. The Kofoid bucket was found to be practical and accurate. It is believed that plans and methods have been found that are dependable and may be used in a permanent program of operations. *T. J. Fitzpatrick.*

3815. Canz, E. **Die Bedeutung des Wassers für das Pflanzenwachstum. [The significance of water for plant growth.]** Jahresh. Ver. Vaterländ. Naturk. Württemberg 77: xxii-xxiii. 1921.—This report of a lecture emphasizes the importance of a liberal water supply for cultivated crops. The diversity of soils with respect to available water is mentioned, and that the amount necessary for vigorous plant development must exceed the wilting coefficient. It is shown that an increase in the harvest is dependent upon an increased water supply.—*A. W. Evans.*

3816. Choux, P. **Revue des travaux de botanique tropicale et subtropicale. 1910–1919. Suite. [Review of work in tropical and subtropical botany 1910–1919. Continued.]** Rev. Gén. Bot. 35: 34–41, 92–100, 141–148. 1923.

3817. Ecological Society of America Committee on the Preservation of Natural Conditions. **Preserves of natural conditions.** *31 p., 15 fig.* Ecological Society of America: 1921.

3818. Guillaume, André. **Étude sur les limites de végétation dans le nord et l'est de la France. [On the limits of vegetation to the north and east in France.]** Compt. Rend. Acad. Sci. Paris 175: 713–716. 1922.—Other authors have studied the limits of distribution of certain arbitrarily chosen species. It is preferable to choose a restricted region and study all of the plants. The area here studied is bounded southwest by Loiret, northwest by the Somme, northeast by Lorraine, and southeast by Haute-Saône. Of 1332 species found, 340 do not extend farther to the north and east. Influences which bring about these limits are discussed under climatic, geologic, physical, and palaeontological headings.—*C. H. Farr.*

3819. Kolkwitz, R. **Ueber die Standorte der Salzpflanzen. III. Triglochin maritima. [Stations for halophytes. III. Triglochin maritima.]** Ber. Deutsch. Bot. Ges. 37: 343–347. 1919.—The author discusses the invasion and establishing of *Triglochin maritima* in certain areas in Germany recently flooded by salt water.—*W. C. Muenscher.*

3820. Kolkwitz, R. **Ueber die Standorte der Salzpflanzen. IV. Erythraea linariifolia. [Stations for halophytes. IV. Erythraea linariifolia.]** Ber. Deutsch. Bot. Ges. 37: 420–426. 1919.—*Erythraea linariifolia,* a halophyte, is found in scattered localities in Germany in which the sodium chloride content of the water is very low. The water in these localities was found to contain large amounts of calcium sulphate.—*W. C. Muenscher.*

3821. Lutz, Frank E. **Altitude in Colorado and geographical distribution.** Bull. Amer. Mus. Nat. Hist. 46: 335–366. 1922.—This is a study based on plants, chiefly those listed in Rydberg's Flora of Colorado, from Portulacaceae to Fabaceae, inclusive. It applies the method of geographic average to the relations between altitudinal (in Colorado) and geographic distribution, and also derives an expression in terms of mid-latitude for Merriam's life zones in Colorado.—*Frank E. Lutz.*

3822. Martelli, Alessandro. **Forze naturali e fattori umani nella transformazioni della montagna. [Natural forces and human factors in the metamorphoses of mountains.]** Ann. R. Ist. Superiore Forest. Firenze 6: 3–21. 1920–1921.—This lecture was delivered at the Royal Superior National Forest Institute, Florence.—*Ferdinand W. Haasis.*

3823. Moreillon, M. **Évaporation de l'eau à l'air libre, à Montcherand (cant. de Vaud). [Free air evaporation of water at Montcherand (canton of Vaud).]** Jour. Forest. Suisse 73: 52–56. 1922.—Observations of the free air evaporation on denuded and non-denuded soils were started by Bühler at Zürich and continued at Tübingen. A table compares the longer records obtained at Tübingen with those obtained at Montcherand, the latter having the higher free-air evaporation. A 2nd table gives values for soils denuded and covered with sod, for humus, limestone, sand and clay. Data obtained with a Wild evaporimeter and by

evaporation measurements of large bodies of water are nearly alike. A 3rd table covering the years 1911–1921, inclusive, shows the free-air evaporation measured with the Wild evaporimeter placed in the shade at Montcherand, 565 m. in altitude. During this period the Wild evaporimeter evaporated 60 per cent of the total precipitation received.—In answer to the question whether the evaporation rate is higher or lower in the mountains than on the plains, preliminary results with a Wild evaporimeter show a lower, and with a Livingston-Amberg evaporimeter a consistently higher rate for increases in altitude. Fog and mist condensations in the mountains have a negligible effect upon the evaporimeters. Slight free air evaporation takes place in temperatures below 0°C. throughout the day.—*G. Kempff.*

3824. Nichols, G. E. **A working basis for the ecological classification of plant communities.** Ecology 4: 11–23. 1923.—This paper is in the nature of a revision and amplification of an earlier one. Its aim is to present the essential facts and principles underlying the ecological classification of plant communities and to suggest a working plan for ecological surveys. The 1st part deals with the plant association as a vegetation-unit in its relation to the environment; the 2nd with the ecological classification of plant associations. Association is described as a group or community occupying a common habitat, the vegetation being similar throughout its extent in physiognomy, ecological structure, and floristic composition. Physiognomy includes the general outward appearance or external morphology of a plant community (ecological structure is to the plant community what morphological and physiological structures are to the plant) while floristic composition is concerned primarily with species which are constantly preponderant either numerically or in mass effect. Layer and group societies are plant communities of subordinate rank within the association. The association is regarded as an organic entity, plant societies bearing a relation to the association somewhat analogous to that borne by the various organs of an individual plant to the plant as a whole. The term association is recognized as applicable both to the abstract vegetation concept and to the concrete individual pieces of vegetation on which this concept is based. Habitat includes everything relating to the factors operative in a geographically definite locality, so far as these factors influence plants. A distinction is made between the general habitat relations of the association as a whole and the specific habitat relations of its constituent elements. Habitat factors are divided into climatic, physiographic, biotic, anthropeic (human), and pyric (fire). The 1st is subdivided into regional and local climatic factors, rhythmical and progressive changes in climate, and other atmospheric influences. Physiographic factors are topographic and edaphic, rhythmical and progressive changes in physiography, and other physiographic influences. Biotic habitat factors are shade, root competition, humus, micro-organisms in the soil, plant and animal invasion, and other biotic influences. (To be concluded).—*J. E. Weaver.*

3825. Olsen, Carsten. **Studies on the hydrogen ion concentration of the soil and its significance to the vegetation, especially to the natural distribution of plants.** Compt. Rend. Trav. Lab. Carlsberg (Copenhague] 15[1]: 1–166. *27 fig.* 1923.—This is a detailed presentation of data upon which a preliminary report has been issued. The investigation, begun in 1916, comprises field observations and cultural experiments extending over 4 years.—Methods for colorimetric determination of H-ion concentration in soil extracts are described; the results of colorimetric and electrometric determinations are compared, generally with agreement within 0.2 pH; both methods have been used in this study. The homogeneity and constancy of the H-ion concentration of the soil were investigated and a comparison made of the acidity shown by the "soil liquid" (obtained by pressure) and the "soil extract" prepared with varying proportions of water. Considerable buffer action was observed in extracts in contact with soil, but very little in filtered extracts. No essential differences in reaction were found in soils taken at depths of 5–20 cm. The quantity of nitrate and ammonia present, as well as their rates of formation, were investigated in soils from the habitats studied, and account also was taken of differences in soil moisture content, level of water table, light intensity, and content of potassium, phosphorus and calcium. The distribution and density of vegetation were determined quantitatively using replicated quadrats 0.1 m. square, and expressing the frequency as

per cent of the number of individuals of the dominant species. The species frequencies are correlated with the H-ion concentration of the soil in 10 tables for each of the meadow and woodland formations, covering the range pH 3.5–8.0 in steps of 0.5 pH. From these tables summarizing tables are prepared showing the average frequency in each pH class of meadow plants from 78 localities and of woodland plants from nearly 200. The author concludes that the H-ion concentration of the soil has an important effect on the composition of plant associations; each species is in general found only within a certain range of H-ion concentration; within this range there is a narrower range in which the species has its greatest average frequency. For some species the wider range is only 3 pH classes; for others it may be 5–6 classes; the narrower range of maximum frequency is usually 1–2 classes. Comparatively few species are sufficiently precise indicators individually to afford a guide to the soil reaction, but when an association consisted of a number of species, the average pH class of their mean maximum frequencies, as determined from the tables, was found to include the H-ion concentration experimentally found.—The greater number of species are found in soils which approach neutrality; also habitats which are approximately neutral are richer in species than those decidedly acid or alkaline.—These conclusions were tested experimentally by growing plants appearing to have different optimal soil reactions in native soils with pH range 3.6–7.7; and in solution cultures in which the reaction was adjusted to a similar range, and maintained by constant drip or by aeration. Typical acid soil plants as *Deschampsia flexuosa* and *Senecio silvaticus* always showed the greatest growth in media of pH 4.5–5.0; they were chlorotic and severely stunted in neutral or alkaline media. Neutral or alkaline soil plants as *Poterium sanguisorba* and *Tussilago farfarus* were most vigorous in media of pH 6.5–7.0. The fact that these plants did not become chlorotic in sub-neutral media shows that lack of available iron was not the cause of the poor growth of acid soil plants in similar media. Only aquatics, as *Helodea canadensis*, were found to thrive in alkaline solutions. It is held that in alkaline soils the water film in contact with plants roots must always be slightly acid due to liberation of CO_2 by the roots.—Experiments were conducted to determine the effect of ammonia as compared with nitrate as a source of nitrogen for acid and neutral soil plants. When their respective acid- and alkaline-producing natures were neutralized even the neutral soil plants grew well with ammonia as the sole source of nitrogen. Acid soils are typically high in NH_3, but that plants characteristic of these habitats are more influenced by the H-ion concentration than the ammonia content of the soil was shown by their poor growth in highly acid media containing NH_4Cl, and their vigorous growth in less acid media containing equivalent amounts of NH_4NO_3.—A tendency to vary in parallel manner was shown in the H-ion concentration of the cell sap and that of the medium in which the plant grew.—No ability on the part of the plants to alter the reaction of solution cultures toward a presumably optimum point was observed. Variations in reaction during growth were traceable to the source of nitrogen, the reaction becoming acid if nitrogen were furnished as ammonia, and alkaline if furnished as nitrate. In a "physiologically neutral" solution containing both ammonia and nitrate no change of reaction occurred. Critical values were reached in the acid direction first by neutral-soil plants and in the alkaline direction by acid-soil plants.—That the presence of aluminum in acid soils is not the sole cause of the avoidance of such soils by neutral-soil plants was shown by the vigorous growth of *Tussilago* in a solution containing Al provided the reaction were kept neutral. Al ions really are toxic to some plants, as barley, and may cause an effect independent of their acid-producing nature on hydrolysis by precipitating phosphoric acid.—*F. Weiss.*

3826. Olsen, Carsten. **The concentration of hydrogen ions in the soil.** Science 54: 539–541. 1921.—This is a somewhat detailed abstract of the article noted in the preceding entry.—*C. J. Lyon.*

3827. Palmer, Ernest J. **The Red River forest at Fulton, Arkansas.** Jour. Arnold Arboretum 4: 8–33. 1923.—The author presents a general account of the forest flora of the southwestern states and cites a number of localities where a remarkably large number of ligneous species occur. Especially Fulton, Arkansas, which is described in its phytogeographical aspects and of which the ligneous plants found within a radius of about 5 km. are listed,

comprising nearly 200 species and varieties of trees and shrubs. Two new supposed oak hybrids are mentioned, *Quercus nigra* × *A. Shumardii* and *Q. Durandii* × *Q. stellata;* and 1 new variety, *Forestiera acuminata* var. *vestita* is described.—Alfred Rehder.

3828. Wangerin, Walther. **Die Grundfragen der Pflanzensoziologie. [The fundamental problems of plant sociology.]** Naturwissenschaften **10:** 574–582. 1922.

STRUCTURE, BEHAVIOR, SYMBIOSIS

3829. Bequaert, J. **Ants in their diverse relations to the plant world.** Bull. Amer. Mus. Nat. Hist. **45:** 333–583. *Pl. 26–29, fig. 77–100.* 1922.—The author summarizes what is known of these varied and often intricate relations as follows: Economic importance of ants; ants as agents in the pollination of flowers; ants and extrafloral nectaries; dispersal of seed by ants; harvesting ants; ants and epiphytes; gall-inhabiting ants; fungus-growing ants; fungus parasites of ants (*Cordyceps, Isaria, Stilbum, Rickia,* and *Laboulbenia*); intracellular bacteria of ants; a review of African myrmecophytes (*Schotia, Macaranga, Cola, Scaphopetalum, Barteria, Epitaberna, Vitex, Uncaria, Sarcocephalus, Randia, Plectronia,* and *Cuviera*): synopis of the literature of recorded myrmecophytes of the world; bibliography of the relations between plants and ants.—*Frank E. Lutz.*

3830. Bouget, Joseph. **Observations sur l'optimum d'altitude pour la coloration des fleurs. [Observations on the optimum altitude for the coloration of flowers.]** Compt. Rend. Acad. Sci. Paris **174:** 1723–1724. 1922.—A study is made of *Hepatica triloba* in the Pyrenees. Plants with white flowers lose their leaves, while those with red or blue flowers retain them all winter. The most brilliant colors occur between 700 and 1000 m. on the north slopes in the shade. At the highest altitudes for this species (up to 2000 m.) the flowers are all white. If planted at 2,850 m. all plants become white. If planted at 500–600 m. the flowers are nearly white. *Ramondia pyrenaica* and *Horminum pyrenaicum* give similar results.—*C. H. Farr.*

3831. Catalano, Guiseppe. **Determinazione razionale della xerofilia. [Rational determination of xerophily.]** Bull. R. Orto Bot. Palermo **2:** 171–221. 1921.—Xerophily is defined as the faculty, present in all autotrophic plants, of living and reacting to a dry habitat by means of physiological adaptation in the time (xerophilous tendency) and adaptation in form and matter in the physical space occupied by the plant structure (xerophilous organization.)—*Edith K. Cash.*

3832. Cockerell, T. D. A. **Bees of the genus Panurginus obtained by the American Museum Rocky Mountain expeditions.** Amer. Mus. Novitates 36. *10 p.* 1922.—This paper and those cited in the following 6 entries are chiefly entomological, but they also contain scattered records of flower visits by bees.—*Frank E. Lutz.*

3833. Cockerell, T. D. A. **Bees of the genus perdita from the western states.** Amer. Mus. Novitates 33. *15 p.* 1922.

3834. Cockerell, T. D. A. **Notes on some western bees.** Amer. Mus. Novitates 40. *7. p.* 1922.

3835. Cockerell, T. D. A. **Some parasitic Megachilid bees of the western United States.** Amer. Mus. Novitates 21. *11 p.* 1921.

3836. Cockerell, T. D. A. **The Epeoline bees of the American Museum Rocky Mountain expeditions.** Amer. Mus. Novitates 23. *16 p.* 1921.

3837. Cockerell, T. D. A. **Two new subgenera of North American bees.** Amer. Mus. Novitates 47. *5 p.* 1922.

3838. Cockerell, T. D. A. **Western bees obtained by the American Museum expeditions.** Amer. Mus. Novitates 24. *15 p.* 1921.—Largely entomological but contains scattered records of flower-visits by bees.—*Frank E. Lutz.*

3839. Frison, Theodore H. **Report on the Bremidae collected by the Crocker Land Expedition, 1913-1917.** Bull. Amer. Mus. Nat. Hist. 41: 451–459. *Pl. 24.* 1919.—This paper is largely entomological but contains a short section on the anthophilous habits of Arctic bumblebees.—*Frank E. Lutz.*

3840. Gates, F. C. **Influence of moonlight on movements of leguminous leaflets.** Ecology 4: 37–39. 1923.—Observations were made at night upon the behavior of the leaves of a number of leguminous plants found in the Philippines, where the temperature was never low enough to counteract any influence moonlight might exert. When the nights were clear and not too humid, the strong moonlight effected the partial resumption of the day position of the leaflets, and also caused the opening of the stomata in at least a few instances. The effects were most pronounced on plants having rather large leaflets, but even then were never carried to completion as they are during the change from night to day.—*John W. Crist.*

3841. Larbaud, Marguerite. **Anatomie des fleurs d'une même espèce â diverses altitudes.** [Anatomy of flowers of the same species at different altitudes.] Compt. Rend. Acad. Sci. Paris 174: 1562–1564. 1922.—*Silene inflata* is particularly studied. At low and high altitudes the flowers are of the same size though fewer in number, but the vegetative part of the plant is proportionately reduced in the mountains. The differences in the morphology and histoloy of the flower parts at high and low altitudes are described. In general the cells are smaller, about $\frac{4}{5}$—$\frac{3}{4}$, and the tissue of the flowers more compact. The opening of the anthers is more precocious in the mountains, and the pollen grains are a little smaller.—*C. H. Farr.*

3842. Lebour, Marie V. **The food of plankton organisms.** Jour. Marine Biol. Assoc. United Kingdom 12: 644–677. 1922.—The marine plankton organisms in the Plymouth region the food of which consists chiefly of diatoms, include most of the common copepods, decapod larvae (excluding the larval lobster and crab megalopae), echinoderm larvae, mollusk larvae, most of the common forms of annelid larvae, *Cyphonautes* (of the Polyzoa), *Tomopteris helgolandicus* (of the Annelida), and *Tornaria* larvae (of the Enteropneusta). Organisms feeding largely on Peridineae include *Actinotrocha* (of the Phoronidea) and the Tintinnids (of the Protozoa).—*Marshall A. Howe.*

3843. Lutz, Frank E., and T. D. A. Cockerell. **Notes on the distribution and bibliography of North American bees of the Families Apidae, Meliponidae, Bombidae, Euglossidae, and Anthophoridae.** Bull. Amer. Mus. Nat. Hist. 42: 491–641. 1920.—This paper cites numerous records of flower-visits by bees.—*Frank E. Lutz.*

3844. Troll, Karl. **Die Entfaltungsbewegungen der Blütenstiele und ihre biologische Bedeutung.** [The biological significance of the movements of the flowerstalk.] Flora 115: 293–392. *Pl. 4–10, 3 fig.* 1922.—Comparative studies, supported by experiment, of pre- and postfloral movements in many species covering a wide range of families, give little support for the theory that such movements are adaptive responses of significance in the struggle for existence. In many cases they are conditioned by the organization of the inflorescence, e. g., in species of such families as the Commelinaceae, Droseraceae, Oxalidaceae, and Boraginaceae in which the inflorescence is a dichasium or a derived type. Such movements are effected by geotropism and epinasty. The similarity of movement in species of *Oxalis* of various habits, habitats, and climates presents many difficulties for the theory of adaptive responses. On the other hand, there is often more or less convergence in type of movement in unrelated forms which live under similar conditions (*Limnanthemum nymphaeoides* and *Hydrocleis, Vallisneria* and *Nymphaea candida, Oxalis acetosella* and *Viola septentrionalis*). Similarity of organization enables them to live under similar conditions although other types are possible; it is not a question of necessity but of possibility.—*A. G. Stokey.*

3845. Wüst. **Die erste und letzte Tracht im Jahre.** [The first and last blossoms of the year.] Bienenpflege 44: 12–13. 1922.—Descriptions are given of the first and last blossoms of the year which attract bees. *Helianthus* is a late bloomer which is frequently visited by bees.—*M. G. Dadant.*

VEGETATION

3846. Arrhenius, O. **Statistical investigations in the constitution of plant associations** Ecology 4: 68–73. 1923.—It has been noticed that on areas increasing in size from y to y_1 the number of species found increases from x to x_1 according to the empirical formula $\frac{x}{x_1} = \left(\frac{y}{y_1}\right)^n$ where n is a constant. Within certain limits this approximation formula holds well for plant communities. Some associations increase their number of species very slowly, others very rapidly, and n has high and low numerical values accordingly; in other words rich types of association have a low n value and the poor ones a high one. The n-values for different associations are given and range from 1.8 to 12.5, the majority being between 2 and 3, with an average for the whole of 3.7. When the area increases very much the calculated value is higher than the observed one. It has been found that the distribution of species over an area follows the laws of probability; or, mathematically stated, if n individuals of a species are found n times on the area $\frac{Y}{n}$ the probability, a, of finding it on a smaller area y is $aY = y$ or $aY = Y + y$ or $a = 1 - (1 - \frac{y}{Y})$. The total of a values equals the probable number of specieson the area y. Where Y is very large and n and y small, it has been observed that when the area increases geometrically the number of species likewise increases up to a certain limit, but when n and y are comparatively large the limit is soon reached. The formula has been found to hold very well for associations and agglomerations of communities in Sweden, Finland, Switzerland and Java.—*T. J. Fitzpatrick.*

3847. Bates, C. G. **The transect of a mountain valley.** Ecology 4: 54–62. *3 fig.* 1923.—From a former extensive investigation in Colorado the conclusion was reached that the zonal distribution of the important forest trees of opposing slopes at the same elevation is due mainly to differences in insolation and its effects upon the soil surface. Since no measurements of light intensity were made, and other data were somewhat unsatisfactory, the present effort was aimed to test this conclusion. A valley was chosen with an axis lying east and west and bounded on either side by ridges only 700 feet apart. On a transect line normal to the contours on both slopes, 14 stations 50 feet apart were established and data gathered, beginning in July, on evaporation, soil temperature at the surface and at 1-foot depth, and soil moisture. The south exposure bears a stand of western yellow pine beginning to be invaded from the top by Douglas fir. The author ascribes this condition to the habit of prompt germination and immediate deep rooting of yellow pine, thus enabling it to succeed on a slope where the striking feature is the rapidity with which the surface moisture may drop below the wilting point. Douglas fir equals yellow pine in these respects but not in its ability to withstand the higher surface temperatures prevailing farther down the slope. The north slope has a cover of Engelmann spruce at its base and a forest of Douglas fir extending to the top. The lack of fir and the presence of spruce in the base area is thought to be due to (a) invasion by spruce when denuded, or (b) factors such as coldness of the site, lack of sunlight, etc., inimical to the more heat-demanding fir, or (c) soil quality unfavorable for fir.—*John W. Crist.*

3848. Boettger, Caesar R. **Meine Exkursion zur spanischen Kolonie Rio de Oro in Westafrika.** [My excursion to the Spanish colony of Rio de Oro in West Africa.] Ber. Senckenberg. Naturf. Ges. Frankfurt a. M. 51: 18–31, 72–84, 167–173. *1 map.* 1921.—In this popular account of Rio de Oro the author includes a few observations on the vegetation, calling attention to the great abundance of the Chenopodiaceae and designating the cactus-like Euphorbiae as the most striking plants of the region.—*A. W. Evans.*

3849. Campbell, Elmer Grant. **Some aspects of Stone Mountain, Georgia, and its vegetation.** Proc. Indiana Acad. Sci. 1921: 91–100. *11 photo.* 1922.—Only lichens are found on the north slope, which is a vertical unbroken wall, but a dense forest of broad-leaved trees and herbaceous plants is found on the narrow rich talus. On the steep south slope grow conifers and flowering herbs, and on the broad south talus an almost pure stand of pine which merges into deciduous trees. The east and west slopes seem to have floras blending between those on the north and south.—*F. C. Anderson.*

3850. Christensen, Carl. **Om Vegetationen paa Høvblege. [Vegetation of Høvblege.]** Bot. Tidsskr. 37: 421–432. 1922.—"Høvblege" is defined as the part of a cliff or hill which is devoid of trees and lies to the southwest part of the woody cliffs. Ostenfeld, in an article in Naturens Verden first called attention to the special vegetation of these areas, or island cliffs. The particular type of vegetation was that of Central Europe in that there were 4 distinct associations dominated by *Linum austriacum, Onobrychis sativa, Poterium polyganum,* and *Resida lutia,* respectively. These island areas have been known for a long time for their orchids, but no specific study had been made. In 1922, Christensen, with K. Wünstedt, made a physiographic ecological study of the various species and their distribution, employing the Raunkiaer statistical method.—*A. L. Bakke.*

3851. Dice, L. R. **Notes on the communities of the vertebrates of Riley County, Kansas, with especial reference to amphibians, reptiles, and mammals.** Ecology. 4: 40–53. 1923.—Much of this article deals with vegetation. The names of many of the animal communities mentioned are suggestive of this, as: willow-poplar, valley forest, hillside forest, thicket, sumac, meadow, prairie, cultivated-field, orchard, ruderal, etc. In practically all the communities the vegetation is given, the dominant species listed, and important observations on the structure of the plant communities included.—*T. J. Fitzpatrick.*

3852. Larsen, J. A. **Association of trees, shrubs, and other vegetation in the northern Idaho forests.** Ecology 4: 63–67. 1923.—The most common herbs, shrubs, and trees in the forests of northern Idaho are listed to afford a better insight into the quality and general characteristics of the habitat. The forest types show differences with increasing altitude, passing from nearly pure yellow pine, bordering the Columbia River Plateau, through western larch, Douglas fir with some yellow pine at higher elevations, and white pine, western hemlock, western red cedar, and lowland white fir on still higher and rougher ground. Above these altitudinally are the sub-alpine forests of mountain hemlock, alpine fir, Engelmann spruce, and lodge-pole pine. These belts often overlap broadly. The mean annual precipitation varies 18–20 inches in the yellow pine association to 27–35 inches in the western white pine community, prolonged drought occurring in the summer. The mean growing season (May to September) has a temperature of 60–65°F. in the yellow pine and 54–60°F in the white pine community. Plant lists give the most frequent and typical species only.—*J. E. Weaver.*

3853. Lauterbach, L. **Die Salzflora von Nauheim und Wisselsheim.. [The saline flora of Nauheim and Wisselsheim.]** Ber. Senckenberg. Naturf. Ges. Frankfurt a. M. 50: 143–152. *13 fig.* 1920.—In the vicinity of the saline springs at Nauheim and Wisselsheim, Germany, a number of characteristic seashore plants occur and stand in sharp contrast to the usual vegetation of the district. The author illustrates and gives non-technical descriptions of the following saline species: *Atriplex patulum* var. *salinum, Erythraea pulchella, Festuca distans, Glaux maritima, Hordeum secalinum, Juncus gerardi, Plantago maritima, Salicornia herbacea, Scirpus maritimus, S. tabernaemontanus, Spergularia salina, Triglochin maritima,* and *Zannichellia palustris.* He calls attention also to the danger of extinction to which such plants are exposed in a highly developed agricultural region and lists several saline species that have already disappeared.—*A. W. Evans.*

3854. Needham, J. G., C. Juday, E. Moore, C. K. Sibley, and J. W. Titcomb. **A biological survey of Lake George, N. Y.** *78 p. 27 fig.* State of New York Conservation Commission: 1922.—A comprehensive biological study was made with special reference to fish production.

Needham describes the hydrography and environment, and the vegetation and its turnovers into fish food. He discusses fish protection and propagation and offers recommendations to improve the fishing.—Juday records limnological observations on the temperature of the lake waters, transparency, dissolved gases, and plankton. Quantitative studies show the total yield of plankton forms and bottom fauna at the time of observation with every indication that an abundance of food materials is developed. The relative importance of certain organisms from the standpoint of fish food is pointed out.—Moore considers the primary sources of food of a number of important fishes of the lake, giving illustrations of food staples and food chains. Plant and animal associations, and limiting factors are discussed.—Sibley gives an annotated list of the fishes of the lake and a food census of the adults.—Titcomb gives the purpose of the investigation, makes several fish cultural observations and offers general recommendations from the standpoint of the fish culturist.—*E. Moore.*

3855. Seward, A. C. **A summer in Greenland.** *100 p., 47 fig.* University Press: Cambridge, 1922.—A popular account of the geography, geology, people, and customs is given, with chapters on flora and fossil plants. Greenland has over 400 species of flowering plants, mostly circumpolar, only 1 endemic. The only trees are willows and birches, reaching a height of 18 feet with stems 1 inch in diameter at age of 100 years. The soil is thawed in summer to a depth of 2–6 feet. All roots are wide spread and superficial. Greenland is a rich field for fossil plants and glacial deposits. Marine drift from great distances may be mixed in glacial deposits with indigenous remains.—*Forrest Shreve.*

3856. Thone, Frank. **Ecological factors in region of Starved Rock, Illinois.** Bot. Gaz. **74:** 345–368. *Fig. 1–5.* 1922.—The region studied is one showing diverse habitats carrying diverse vegetation complexes derived from "the glacial relicts left behind by the northern retreat of the first post-Pleistocene flora, outliers from the mesophytic southeastern forests, forerunners of the western and southwestern plains, and desert types." The author's summary follows: This paper is a study of the ecological factors at 7 representative topographical points during the growing season of 1921. The factors studied were soil moisture, evaporating power of the air, evaporating power of solar radiation and temperature of air and soil. Observations were taken with special reference to their influence on seedling growth, because of the importance of the latter as a factor in succession. Soil moisture was found to vary (a) seasonally, falling off after the close of the spring rains and reaching a point below the minimum necessary for plant growth during a considerable portion of the summer, and rising again with the beginning of the fall rains; (b) according to the mechanical composition (and therefore retentivity) of the soil; (c) to a minor extent according to topography; and (d) according to the density of the foliage canopy. The evaporating power of the air was found to vary (a) seasonally, increasing until midsummer and falling off afterward; (b) according to the state of tree foliation, declining after the forest had become completely clothed; and (c) topographically, being greatest for the same period in exposed stations and least in sheltered ones. The evaporating power of solar radiation was found to vary in the same manner as the evaporating power of the air, complementing and emphasizing the data under the latter head. Maximum temperatures were found to vary in much the same manner as the evaporating power of the air. Minimum temperatures of the air were found to be affected by topography in a mode inverse to that of the maxima, being highest at the low lying stations and lowest at the higher lying ones. Certain vegetational phenomena showed a general correlation with the instrumental observations: (a) the density of ground cover, number of tree seedlings, and proportion of annuals in the total vegetation of any given association bore an inverse relation to the relative xerophytism; (b) in all but one of the stations conditions were favorable for the development of seedings only in spring and fall; (c) in the climax forest for the region (upland oak woods) the water-supplying power of the soil consistently fell nearly or quite to zero during the summer drought period; (d) the location of "subclimax" and "superclimax" associations showed closer correlation with water relations than with temperature.—*B. W. Wells.*

APPLIED ECOLOGY

3857. Alfonsus, Alois. **Ueber die Errichtung von Pflanzgarten. [The establishment of the gardens.]** Deutsche Imker 36: 36. 1923.—Varieties of bee plants are given adapted to the small garden.—*M. G. Dadant.*

3858. Baldwin, E. G. **The honey regions of Florida.** Amer. Bee Jour. 62: 150–153. *Fig. 1–5.* 1922.—The most important honey plants in Florida are *Nyssa aquatica, N. biflora,* orange, *Cassia chamaecrista, Castanea pumila, Sabal megacarpa, S. Palmetto, Avicennia nitida, Ilex glabra, Hippomane Mancinella, Satureja rigida,* and *Mesophaerum spicatum.* Because of the great extension southward of peninsular Florida the honey flora and conditions of bee culture differ widely in the northern and southern portions of the state.—*J. H. Lovell.*

3859. Buchegger, Josef. **Die Goldrute und ihr Anbau. [The goldenrod and its cultivation.]** Tiroler Bienenzeitg. 9: 12. 1922.—The writer describes the best conditions for growing *Solidago canadensis.* It is a desirable addition to the honey flora.—*M. G. Dadant.*

3860. Campbell, S. M. **Nectar secretion at high altitudes.** Gleanings in Bee Culture 50: 792. 1922.—At high altitudes in the San Francisco Mountains in Arizona more honey is gathered than in the plains.—*J. H. Lovell.*

3861. Cobb, L. H. **Fall pasture for bees.** Amer. Bee Jour. 62: 369. 1922.

3862. Coleman, Geo. A. **Beekeeping in our California national forests No. II. Honey flora.** Western Honey Bee 11: 23–25. 1922.—*Salvia Columbariae* blooms Apr.–May and yields an excellent white honey. *S. mellifera* is the most important honey plant in its range (Mt. Diablo southward to San Diego County), blooms Apr. –July 15, and yields a water-white honey of excellent flavor. *S. apiana* blooms March–May and yields white honey of fine flavor. *S. sonomensis* blooms May–June and yields a honey similar to that of white sage. *Koellia californica* and *Monardella villosa* are minor honey plants in the Coast Ranges. *Artemsia californica* is valuable for its abundant pollen. *Solidago californica,* common on dry plains, is a valuable honey plant Sept.–Dec. *Baccharis pilularis* is common in the Coast Ranges and furnishes a large amount of honey.—*J. H. Lovell.*

3863. Davidson, John. **Factors affecting nectar secretion in flowers.** Amer. Bee Jour. 62: 153-154. 1922.

3864. Engle, M. C. **Beekeeping in Cuba.** Beekeepers' Rev. 36: 9. 1922.—Beekeeping at Herradura is briefly described.—*J. H. Lovell.*

3865. Holmes, T. E. **Beekeeping in the Idaho Panhandle.** York's Bees and Honey 3[10]: 6. 1922.—Notes are given on the honey plants of northern Idaho. The main sources of honey are fireweed and clover.—*J. H. Lovell.*

3866. Holst, Axel. **Beekeeping in the Virgin Islands.** Amer. Bee Jour. 62: 57–58. 1922.—Ninety per cent of the honey is gathered from trees and is mostly dark in color. There are 2 heavy honey flows, 1 in spring and 1 in fall. A list of the more important honey plants is given.—*J. H. Lovell.*

3867. Holst, Axel. **Nectar secretion in the tropics.** Amer. Bee Jour. 62: 265. 1922.

3868. Lund, John. **Alfalfa yields in the East.** Gleanings in Bee Culture 50: 642. 1922.—At Landenburg, Pennsylvania, bloom of the 2nd crop of *Medicago sativa* yielded a surplus of honey, some colonies storing 40 pounds. Alfalfa allowed to stand produced a big crop of seed.—*J. H. Lovell.*

3869. Moore, B. **An interesting example of applied ecology.** [Rev. of: Jardine, J. T., and C. L. Forsling. [Range and cattle management during drought. U. S. Dept. Agric. Bull. 1031. 1922.] Ecology 4: 82–84. 1922.

3870. Parks, H. B. **Agarita, guajillo and mesquite.** Amer. Bee Jour. 62: 412–413. *Fig. 1–4.* 1922.—Agarita (*Berberis trifoliata*), abundant on the limestone hills of the Edwards Escarpment, Texas, blooms in early spring and is said to yield a light amber honey of good flavor. Guajillo (*Acacia Berlandieri*), common on the dry stony ridges of southern Texas, secretes a large amount of nectar. The honey, which is a very light amber color or milky white, with a mild, excellent flavor, granulates quickly. Mesquite (*Prosopis glandulosa*), yielding a light amber honey of fair quality, is common in southern Texas but not reliable every year.—*J. H. Lovell.*

3871. Parks, H. B. **Phacelia.** Amer. Bee Jour. 62: 213. 1922.—*Phacelia integrifolia* is abundant along the Edwards Escarpment, Texas, and is very attractive to bees.—*J. H. Lovell.*

3872. Parks, H. B. **The blue bonnets as an aid to the bees.** Beekeepers' Item 6: 137–138. *Fig. 1.* 1922.—*Lupinus subcarnosus* is most common in Texas between the Trinity and Sulphur Rivers and the high plain area and is adapted to limestone soil. Lupines are all nectarless, though this species is often erroneously reported by Texas beekeepers to yield small amounts of nectar. It is a valuable pollen flower, large quantities of orange-red pollen being gathered by bees. It is recommended as an ornamental.—*J. H. Lovell.*

3873. Pellett, F. C. **Beekeeping in Manitoba.** Amer. Bee Jour. 62: 497–500. *Fig. 1–6.* 1922.—An account is given of conditions on the prairie and in the bush in the country about Winnipeg. South and west is level prairie, while north and east the land is covered with small poplars and other quick-growing trees. Immense crops of wheat, oats, and barley are grown. Large crops of honey are secured from *Cirsium arvense, Grindelia squarrosa, Melilotus alba, Tilia americana, Taraxacum officinale, Medicago sativa, Symphoricarpus racemosus,* asters, and goldenrods. An average of 150 pounds per colony is usual in well-cared-for apiaries.—*J. H. Lovell.*

3874. Raggatt, H. W. **Beekeeping in Australia.** Gleanings in Bee Culture 50: 773. 1922.—Eucalyptus yields 95 per cent of Austrialian honey, most apiaries being located in forests. Out of every 5 years, 2 are good, 2 poor to medium, and 1 very poor. Lack of pollen often causes loss of many colonies.—*J. H. Lovell.*

3875. Richter, M. C. **Migratory beekeeping.** Gleanings in Bee Culture 50: 436–438. *Fig. 1–2.* 1922.—Brief mention is made of the more important sources of honey in California.—*J. H. Lovell.*

3876. Richter, M. C. **Regional differences in California.** Amer. Bee Jour. 62: 358–360. *Fig. 1–6.* 1922.—Five climatic regions are recognized in California: (1) Northern coast region, not adapted to beekeeping as there are few honey plants, and the summer is cool and damp. The spring bloom includes *Arctostaphylos manzanita, Ceanothus cuneatus, Erodium cicutarium,* and *Medicago hispida.* Later blooming honey plants are white clover, white sweet clover and alfalfa. (2) Central coast region near Sacramento, depending for its surplus honey on fruit bloom, wild mustard, cultivated asparagus and onions, sweet clover, and alfalfa. Large amounts of honeydew are also gathered. South in this region the honey flora includes *Salvia mellifera, Lotus glabra, Eriogonum fasciculatum,* and manzanita. (3) Southern coast region, which has yielded most of the large crops of California honey. The honey plants are *Salvia mellifera, S. apiana, S. leucophylla,* orange, Eucalyptus, lima bean, *Lotus glabra, Eriogonum fasciculatum, Rhus diversiloba, Hemizonia fasciculata, Trichostema lanceolatum,* and others. (4) Interior valley region, including Great Central Valley and Imperial Valley. Irrigated alfalfa is the principal honey plant. Other sources are fruit bloom, white sweet clover, Euca-

lyptus, melons, *Wislizenia refracta*, *Hemizonia fasciculata*, and *Trichostema lanceolatum*. In the Imperial Valley cotton yields a large amount of honey. (5) The mountain-plateau region, which has been little explored. Alfalfa is the chief honey plant, and sweet clover and *Eriogonum fasciculatum* are important in the fall. *Chrysothamnus nauseosus* yields a dark, ill-flavored honey. The Owens Valley in Inyo County is an excellent location.—*J. H. Lovell.*

3877. Richter, M. C. **The California orange flow.** Gleanings in Bee Culture 50: 76–78. *Fig. 1–3.* 1922.—Comparatively cool nights followed by warm days, the temperature rising to 85–95°F., results in very rapid nectar secretion; 15–20 pounds of honey may be stored daily. The orange flow may last only 10 days or extend over a month.—*J. H. Lovell.*

3878. S., G. L. **Honey plants of Oregon.** Western Honey Bee 10: 313–314. 1922.—Several species of *Vaccinium* are abundant in Oregon, but their relative value as honey plants is unknown. *V. parvifolium* yields a light amber honey of mild peculiar flavor, very thick and waxy, and difficult to extract.—*J. H. Lovell.*

3879. Sklenar, Guido. **Götterbaum.** [**Tree of heaven.**] Leipziger Bienenzeitg. 37: 49. 1922.—The conditions governing the production of honey by the flowers of this tree are explained. It has been highly praised as desirable in Germany for both shade and nectar.—*M. G. Dadant.*

3880. Slattery, J. J. **Sourwood an uncertain yielder.** Gleanings in Bee Culture 50: 440. 1922.—At Hendersonville, North Carolina, 100 strong colonies stored 1,100 pounds of honey from *Oxydendrum arboreum*. Every few years this tree yields an enormous amount of honey, but the flow never lasts more than 5 weeks.—*J. H. Lovell.*

3881. Southard, A. E. **Palestine honey production.** Beekeepers' Rev. 36: 8–9. 1922.—There are only 4–5 weeks annually for honey-gathering in Palestine; the dry season lasts from April to October, and the rainy season from November to March. Orange, lavender, mint, wild thyme, Acacia, and cactus flowers are the chief sources of nectar.—*J. H. Lovell.*

3882. Suter, R., and E. Moore. **Stream pollution studies.** *34 p., 7 pl., 37 fig.* New York State Conservation Commission: 1922. [Also in: State of New York Conservation Commission, eleventh annual report, for the year 1921. Legislative Document No. 29.]—Certain common and easily recognized plants and animals of streams are recommended for practical use as indicators of intensity of pollution. A stream polluted by organic wastes is conveniently divided into 3 zones: zone of recent pollution, septic zone, and zone of recovery, all occurring if the volume of waste is excessive.—Typical indicators of these zones are listed. In the zone of recent pollution may be found *Thiotrhix* sp., *Saprolegnia* sp., *Leptomitus lacteus* Agardh, *Sphaerotilus natans* Kütz., and tubifex worms (*Tubifex tubifex*). Green plants disappear as the lower limit of the zone is reached.—The septic zone, in which the oxygen supply is practically nil, is characterized by *Eristalis tenax* (L.), *Psychoda alternata* Say, *Erioptera sp.* Green plants reappear and reoxygenate the water at the lower limits of this zone. The zone of recovery is characterized by the presence of sludge in which bloodworms multiply excessively, a common form being *Chironomus decorus* Johann. The following fish regarded as tolerant forms frequent this zone, growing fat on the bloodworms: *Catostomus commersonii* Lace., *Ameiurus nebulosus* Les., *Semotilus atromaculatus* Mitch., *Campostoma anomalum* Raf. Other tolerant animals are: *Arctocorixa, Pisidium abditum* Hald, *Simulium venustrum* Say, *Asellus communis* Say, *Cambarus immunis* Hagen, and such plants as *Potamogeton pectinatus* L. and *P. americanus* C. & S.-Typical plants of the clean waters are markedly green, including green algae, as *Hydrodictyon reticulatum* (L.) Lagerh., and water mosses, as *Hypnum riparium*. Game fishes appearing in these waters are: *Micropterus dolomieu* Lace., *Salvelinus fontinalis* Mitch., *Salmo salar sebago* Gir, *Micropterus salmoides.*—A brief general discussion is given of the energy and food relations of plants and animals followed by a consideration of their requirements in the different zones of pollution.—The limits of tolerance of fish to trade wastes are compiled in a table. Authorities are cited.—*E. Moore.*

3883. WEIPPLE, THEODOR. **Unter welchem Bedingungen empfielt sich die Einbürgerung der Goldrute?** [What conditions are necessary for the introduction of the golden rod?] Illus. Monatsbl. Bienenzucht. 23: 25–26. 1923.—Further particulars are given as to methods of growing goldenrod in America with notes on the possibilities of its introduction into Continental Europe.—*M. G. Dadant.*

3884. WILDER, J. J. **Chinaberry.** Dixie Beekeeper 3^{10}: 24. 1922.—*Sapindus Drummondii* blooms in southeastern Georgia late in March but yields no surplus as the nectar is used as soon as gathered in stimulating brood-rearing.—*J. H. Lovell.*

3885. WILDER, J. J. **Mexican clover.** Dixie Beekeeper 4^{4}: 10. 1922.—*Richardia scabra* in southeastern Georgia furnished a heavy honey flow during June and July of 1922. The bloom yields heavily only in the morning, from dawn until 10 o'clock; during the heat of the day nectar secretion nearly ceases. The honey has a pleasant flavor and a large surplus is obtained.—*J. H. Lovell.*

3886. WILDER, J. J. **Partridge pea.** Dixie Beekeeper 4^{4}: 20–21. 1922.—The flowers of *Cassia chamaecrista* are nectarless, but extra-floral nectaries on the petioles secrete nectar freely. An average per colony of about 40 pounds of comb honey and 50 pounds of extracted honey is often obtained.—*J. H. Lovell.*

3887. WILLSON, H. B., J. C. DICKMAN, and W. C. BARNARD. **Nectar from velvet bean.** Gleanings in Bee Culture 50: 774. 1922.—In Mississippi *Mucuna utilis* is reported to secrete nectar freely, but bees do not gather it because of its repulsive taste. In southern Georgia a small surplus is gathered from this source; the honey has a peculiar acid flavor. *Richardia scabra* is a most valuable summer and fall honey plant in Georgia.—*J. H. Lovell.*

3888. WOODS, D. C. **The honey industry of Haiti.** The Beekeepers' Rev. 37: 7. 1922.—Beekeeping in Haiti is favored by abundant nectariferous plants. Honey from *Haematoxylon campechianum* is nearly white and has a delicate flavor. It may become cloudy in 2–3 months and granulate.—*J. H. Lovell.*

3889. ZEISS. **Die einjährige Riesenhonig—(Hubam)—Klee.** [**The great annual honey plant—Hubam clover.**] Bienenpflege 44: 6. 1922.—The discovery of annual white sweet clover and its value to the beekeeper and agriculturist are briefly recounted. The high price of seed has prevented testing in other countries than that in which it was discovered (U. S. A.).—*M. G. Dadant.*

FOREST BOTANY AND FORESTRY

J. S. ILLICK, *Editor*

(See also in this issue Entries 3728, 3822, 3823, 3847, 3852, 3873, 4031, 4130, 4290, 4370, 4392, 4484, 4618, 4631, 4670, 4673, 4679, 4702)

3890. ANONYMOUS. **A drill for the tree-dentist.** Sci. Amer. 126: 259. *1 fig.* 1923.—A motor driven tree-drill, with a burr made up of 11 tool-steel circle-saw blades is described.—*Chas. H. Otis.*

3891. ANONYMOUS. **Baling trees.** Sci. Amer. 127: 340. *1 fig.* 1922.—A mechanical packer or baler, as employed by the U. S. Forest Service, is described. It is used preliminary to transporting seedlings from the seed bed to the place of planting.—*Chas. H. Otis.*

3892. ANONYMOUS. **Brennstoffmangel und Forstwirtschaft.** [**Fuel shortage and forestry.**] Deutsch. Forstzeitg. 37: 730. 1922.—The fuel shortage has led to heavy cutting of fire wood and use for fuel of timber needed for constructon, etc. The entire timber cut in Germany

would supply only a small fraction of the needed fuel. To save the forests and the wood-using industries, cities and industrial plants must the provided with coal.—*W. N. Sparhawk.*

3893. Anonymous. **Determining the penetration of wood preservatives.** Sci. Amer. **127:** 11. 1922.—The tests used by the U. S. Forest Products Laboratory for determining the depth to which wood preservatives penetrate are given.—*Chas. H. Otis.*

3894. Anonymous. **Giant trees in the olden days.** Sci. Amer. **126:** 379. 1922.

3895. Anonymous. **Introduction of exotics into jarrah forests.** Australian Forest. Jour. **5:** 281–282. 1922.—The propagation of certain valuable exotics in mixture with indigenous species has been successful. Wattles (*Acacia pycnantha, A. decurrens,* and *A. dealbata*), *Pinus pinaster,* and *P. halepensis* are noted.—*C. F. Korstian.*

3896. Anonymous. **New tanning material.** Australian Forest. Jour. 5: 219–223. 1922.—The manufacture of mixed tanning extracts, suitably blended, is advocated to relieve the world shortage of vegetable tanning materials. Average tannin content and particulars of distribution are given for several species of *Acacia* and *Eucalyptus* and *Callistris calcarata.* Some are not sufficiently plentiful to be a regular source of tanning extracts but considered collectively they may yield appreciably, incidental to the regular logging operation.—*C. F. Korstian.*

3897. Anonymous. **Paper from Australian timber.** Agric. Gaz. New South Wales **34:** 57. 1923.—A good quality of paper has been made from pulp, 60 per cent of which was made from *Eucalyptus regnans, E. sieberiana,* and *E. delegatensis,* and 40 per cent being imported sulphite pulp.—*L. R. Waldron.*

3898. Anonymous. **Spraying trees from the air.** Sci. Amer. **126:** 333. *1 fig.* 1922.—A grove of 500 caterpillar infested catalpa trees was successfully dusted with lead arsenate from an airplane.—*Chas. H. Otis.*

3899. Anonymous. **The baobab or bottle-tree.** Australian Forest. Jour. 5: 279–281. 1922.—*Adansonia Gregorii* is described as one of the characteristic yet unique trees of the savannah, attaining a height of 30–40 feet and a thick barrel- or bottle-shaped trunk 10–18 feet high and 6–20 feet in diameter.—*C. F. Korstian.*

3900. Anonymous. **The West Australian red gum.** Australian Forest. Jour. **5:** 203–206. 1922.—*Eucalyptus calophylla,* containing a high percentage of tannins, is suggested as a new tanning material to supplement the waning supply of tan-bark of the 2 wattles, *Acacia pycnantha* and *A. decurrens.*—*C. F. Korstian.*

3901. Anonymous. **Timbers of the north Kimberleys.** Australian Forest. Jour. **5:** 130–132. 1922.—Brief descriptions are given for some of the trees occurring as scattered specimens in the "savannah forest."—*C. F. Korstian.*

3902. Badoux, H. **Dégâts par le charançon du sapin. [Depredations of the fir weevil.]** Jour. Forest. Suisse **73:** 68–69. 1922.—The author describes the characteristics and habits of *Pissodes piceae* Ill., which appeared during 1921 in white fir stands. It is not of economic importance unless followed by *Sirex gigas,* a trunk borer. Where this combination is feared, all branches infested with the weevil should be removed and barked, or burned.—*G. Kempff.*

3903. Barbey, A. **Le charançon des aiguilles du sapin. (Polydrosus pilosus Gredl). [The fir needle weevil.]** Jour. Forest. Suisse **72:** 186–189. *1 pl.* 1921.—The insect and its activities in partially defoliating white fir during the spring of 1921, representing its first serious invasion into Swiss forests, are described. All damage is caused by the adult, mainly during the first 3 weeks in June. The result is a loss of volume increment.—*G. Kempff.*

3904. Baust. **Durchforstung (Läuterung) von Fichtenschonungen. [Thinning of young spruce stands.]** Deutsch. Forstzeitg. **37**: 580–582. 1922.—Volunteer pine frequently invades spruce plantations; the former, growing more rapidly and having spreading crowns, may injure the spruce. Such pines should be removed while small; if delayed, too sudden removal may subject the spruce to injury from wind, sun-scald, and snow-breakage.—*W. N. Sparhawk.*

3905. Binder. **Die Benutzung des Pfluges zur Begründung von Kiefernkulturen auf schlecten Sandböden. [The use of the plow in establishing pine plantations on poor, sandy soils.]** Forstwiss. Centralbl. **44**: 249–252. 1922.—Contrary to the assertion of Möller, great value is claimed for plowing in establishing pine (or spruce) on poor sandy soils, especially where heather is liable to menace the young trees. Results obtained from plowing and from hacking the soil by hand are compared.—*W. N. Sparhawk.*

3906. Diederich, Eugen. **Die niederländische Forstwirtschaft. [Forestry in the Netherlands.]** Forstwiss. Centralbl. **44**: 420–424. 1922.—The forests originally covering most of the Netherlands were early destroyed; by the 13th century it was necessary to import timber from Danzig. In 1833 the forest area was only 169,026 hectares; it gradually increased to 260,923 hectares in 1911, and since then has again decreased, being 247,785 hectares in 1920, or 7.59 per cent of the total land area. The areas of forest are given for individual provinces and by kinds of forest. Conifer high forest covers 134,222 hectares, broadleaf high forest 20,412 hectares, and coppice and willow-holts the remainder. Large areas have been planted since 1889, principally to *Pinus silvestris*, with occasional hardwoods, and along the coasts to the more resistant *P. laricio* vars. *austriaca* and *corsica*.—*W. N. Sparhawk.*

3907. Eberhard, J. **Neue und alte Betriebsformen. [New and old cutting systems.]** Forstwiss. Centralbl. **44**: 326–342. 1922.—Characteristics of the various methods of cutting are discussed, with especial reference to the "wedge shelterwood" system (Schirmkeilschlag) developed by Eberhard at Langenbrand. The writer emphasizes the fact that no system can be applied schematically, and that silvicultural methods must be adapted to the multitude of varying conditions met in any forest.—*W. N. Sparhawk.*

3908. Funke, G.-L. **Sur les pousses supplémentaires estivales. [On the supplementary shoots of trees in summer.]** Compt. Rend. Acad. Sci. Paris **175**: 901–904. 1922.—A study was made in the forest of Fontainebleau on the following species: *Carpinus betulus, Quercus robur, Celtis australis, Wistaria sinensis, Ligustrum vulgare,* and *Evonymus europeus.* It is concluded that in determining the age of trees by the number of annual rings, the "august shoots" have not usually constituted a source of error.—*C. H. Farr.*

3909. Gill, Walter. **Annual progress report upon state forest administration in South Australia for the year 1921-22.** Ann. Prog. Rept. Woods and Forests Dept. South Australia. *13 p.* Adelaide, 1922.—This routine administrative report discusses general conditions and progress. The area of Forest Reserves is reported as 190,474 acres; 748,033 trees were planted, with a survival of 91 per cent. The revenue for the year amounted to £11,234.—*C. F. Korstian.*

3910. Hastings, A. B. **Fighting the forest-fire menace.** Virginia Geol. Comm. Office of State Forester Bull. 20. *16 p.* 1920.—This popular bulletin is designed to aid in the organized campaign against the fire menace.—*C. F. Korstian.*

3911. Hastings, A. B. **Forest wardens' manual.** Virginia Geol. Comm. Office of State Forester Bull. 22. *31 p.* 1921.—The manual is a handbook of instructions and information for the forest wardens of Virginia.—*C. F. Korstian.*

3912. Heck. **Beiträge zur forstlichen Zuwachskunde. [Notes on the study of forest increment.]** Forstwiss. Centralbl. **44**: 290–326. *6 fig.* 1922.—The author discusses some of

the results of his 24 years of measurements on permanent sample plots of beech, spruce, ash, and fir. The measurements, taken carefully each year, show the very great annual variations in rates of growth which are obscured in periodic (5-year) measurements. It is also shown that trees with straight, clear stems grow at a more rapid rate than others,—a fact of considerable importance in making thinnings. Data are presented showing growth by months during several years. In general, diameters measured in the east-west direction are somewhat greater than in a north-south direction.—*W. N. Sparhawk.*

3913. Helms, A. **Introducing exotic conifers into New South Wales.** Australian Forest. Jour. **5**: 27–30, 176–179. 1922.—The climate and forest conditions of the Pacific Northwest (U. S. A.) are discussed with particular reference to *Pseudotsuga taxifolia*. Its yields in the Cascade Mountains of Washington and Oregon are compared with those in Prussia and Denmark. The conclusion is reached that Douglas fir is one of the world's most rapid-growing conifers, producing timber with a wide range of uses. If present experiments result in the successful introduction of this tree into New South Wales it is believed that it will become one of the most important exotics.—*C. F. Korstian.*

3914. Herrmann. **Bericht über die Waldsamenernte für 1922.** [The 1922 forest-seed crop.] Deutsch. Forstzeitg. **37**: 813-816. 1922.—This report discusses the crops of forest tree seeds of the principal species in different parts of Germany.—*W.-N. Sparhawk.*

3915. Herrmann. **Bericht über die Waldsamenernte für 1922.** [Yield of forest seed in 1922.] Deutsch. Forstzeitg. **37**: 655–656. 1922.—The prospects of a seed crop of the most important species in different parts of Germany are discussed.—*W. N. Sparhawk.*

3916. Hofmann, J. V. **Furred forest planters.** Sci. Monthly **16**: 280–283. 1923.—The work of rodents is discussed. They may become plentiful enough to prevent seeding, but are usually an important factor in the regeneration of forests.—*L. Pace.*

3917. Hohenadl, W. **Neue Grundlagen der Holzmessung.** [New principles of forest mensuration.] Forstwiss. Centralbl. **44**: 55–68, 109–117, 150–159, 184–194, 233–240, 388–399. 1922.—The author discusses the use of higher mathematics in measuring the growth and volume of trees and stands.—*W. N. Sparhawk.*

3918. Holmes, J. S. **Forest fires in North Carolina during 1918, 1919 and 1920 and forest protection in North Carolina.** North Carolina Geol. and Econ. Surv. Econ. Paper 51. *82 p.* 1921.—This bulletin contains information concerning the amount and extent of damage caused by forest fires in North Carolina. The need for greater care in handling fire in and near woods is stressed.—*C. F. Korstian.*

3919. Jones, Richard Chapin. **The administrative report of the Virginia State Forester for the calendar years 1920–1921.** Virginia Geol. Comm. Office State Forester Bull. 24. *63 p.* 1922.—Recommendations for certain additions to present forestry laws and necessary extensions of the work are included.—*C. F. Korstian.*

3920. Jones, Richard Chapin. **The forest resources of Virginia.** Virginia Geol. Comm. Office State Forester Bull. 19. *11 p.* 1919.—The author presents a short account of the character, amount, value, and condition of the forest resources of the state, with a warning that under present destructive practices they are being depleted, and that the industries dependent on them are threatened.—*C. F. Korstian.*

3921. K., S. **Sächsische Wald- und Holzwirtschaft.** [Saxon forest regulation.] Deutsch. Forstzeitg. **37**: 538–539. 1922.—The annual cut in Saxon state forests has just been reduced from 800,000 to 500,000 cubic m. This was necessary in spite of the pressing demand for wood because the forests were being overcut and the forest capital reduced. The paper mills of Saxony alone require 1,250,000 cubic m. annually.—*W. N. Sparhawk.*

3922. Lemmel. **Das Problem der volkswirtschaftlichen Produktivität und seine Stellung in der Staatsforstwirtschaft.** [The problem of economic productivity and its position in government forest management.] Zeitschr. Forst.- u. Jagdw. 54: 129–160. 1922.—This academic discussion covers (1) the problem; (2) the conception of political economy, past, present, and personal; (3) the essence of productiveness; (4) the qualifications of economic productiveness including the determination of the aims of domestic economy as limited by social usage; and the technic.—It is fundamentally unimportant whether the science of politico-economic productiveness is based upon the theory of use or that of cost.—*J. Roeser.*

3923. Lewis, C. M. **Ashes and sawdust the basis of a new industry.** Sci. Amer. 126: 396. *3 fig.* 1922.—Ashes and sawdust are the main ingredients of a cheap composition used as a substitute for cardboard and wood in the manufacture of boxes.—*Chas. H. Otis.*

3924. Matthäi. **Die waldbauliche Bedeutung der Samenprovenienz bei der Eiche.** [Silvicultural importance of origin of seed of oak.] Forstwiss. Centralbl. 44: 405–419, 463–484. *2 fig.* 1922.—While broadleaf species originally predominated in the forests of Germany, they generally gave way to conifers as the better soils were cleared for agriculture and large clear-cut areas were planted to conifers, which were easier to plant and grew more rapidly than oak, beech, and other hardwoods. As a result of the general impoverishment of the forest soils, foresters realized the need of increasing the proportion of beech and favoring natural reproduction where practicable. As beech and oak together utilize the soil better than either alone, the cultivation of oak was stimulated also. The source of seed for establishing oak stands is therefore of great importance.—The significance of origin of seed is discussed in relation to modern theories of genetics. Those forms of a given species will do best on a given site which have developed on the same or a similar site, as shown for pine, spruce, and larch by Schott, Cieslar, Engler, and others.—On the basis of phenology, 6 zones can be distinguished within the range of the European white oak (sessile and pedunculate oaks): (1) a very early zone with insular climate, where the foliage develops before Apr. 24 and the growing period is over 200 days; (2) an early zone with warm climate, foliage appearing Apr. 24–May 2, and 180–190 days growing season; (3) an early zone with moderately warm climate, leaves appearing May 3–5, with 163–173 days growing season; (4) a late zone with cool climate, vegetation starting May 6–10 and growth lasting 158–162 days; (5) a late zone with cold climate, foliage starting May 11–18 and growth lasting 154–157 days; (6) a very late zone with cold climate, growth starting after May 19 and lasting 145 days or less. The geographical and altitudinal location of these zones is given in some detail. The average growth rates of the oaks developed in the different zones decrease as climatic conditions become less favorable, and growth and yield data must be worked up separately for the several climatic "races." Within each zone the outward forms of the trees have certain distinguishing characteristics; similarly the associated species of trees and smaller vegetation are different.—While Kienitz, Arndt, Hauch, and others have studied the effects of source of seed, much more comprehensive investigations should be undertaken; meanwhile the extreme importance should be recognized of using seed adapted to the site.—*W. N. Sparhawk.*

3925. Mell, C. D. **The peer of decorative hardwoods.** Sci. Amer. 126: 254. *3 fig.* 1922.—Rosewood, its source of supply, and former and present uses are described. The largest amount is used in professional and scientific instruments; smaller amounts are used for fixtures, musical instruments, railroad cars, sporting and athletic goods, handles, furniture, etc.—*Chas. H. Otis.*

3926. Müller, H. **Die Verjüngung litauischer Kiefern-Fichten-mischbestände. Ein Schwanengesang.** [The regeneration of Lithuanian pine-spruce mixed stands. A swan-song.] Zeitschr. Forst.- u. Jagdw. 54: 161–170. *Fig. 1–2.* 1922.—The author discusses clear-cutting versus natural regeneration and sees in the "continuous management" idea a method of conversion from clear-cutting systems to natural regeneration systems. When the author took over the forest district Uszballen in 1913, clear-cutting and artificial regenera-

tion were practiced in the pine-spruce stands on all but 1 compartment. Storm and nun-moth damage in 1913 necessitated a change in the silvicultural system, which led to the selection systems with natural reproduction to fit the needs of individual stands. The problem is discussed, also various technical features concerning the careful cutting of the understory during spruce regeneration—fellings and artificial methods to aid the securing of spruce regeneration.—*J. Roeser.*

3927. O'Byrne, J. W. **The forests of Russell County, Virginia.** Virginia Geol. Comm. Office of State Forester Bull. 21. *23 p., 10 pl.* 1922.—This bulletin is a continuation of the series of reports on the forest resources of the state, by counties. It describes the forest conditions of Russell County and stresses the necessity of more conservative cutting to prevent depletion of the timber supply.—*C. F. Korstian.*

3928. Oelkers. **Kohlensäure und Jahrring. [Carbon dioxide and annual rings.]** Zeitschr. Forst.- u. Jagdw. **54:** 170–174. 1922.—The author analyzes the desirability of the continuous selection systems. He states that the rate and quantity of wood production depends upon the available CO_2, which is derived mainly through the decomposition of litter and other organic matter on the ground. To increase both CO_2 and wood production, soil culture and protection are necessary. This is accomplished in the continuous selection systems by well executed thinnings which regulate the amount of precipitation and sunshine reaching the soil, the accumulation of a satisfactory quantity and kind of litter on the ground, and the proper distribution of humus.—*J. Roeser.*

3929. Pack, Charles Lathrop. **Trees as good citizens.** *257 p., illus. (partly col.).* American Tree Assoc.: Washington, D. C., 1922.

3930. Paessler. **Über den Gerbstoffgehalt der Douglasienrinde. [The tannin content of Douglas fir bark.]** Forstwiss. Centralbl. **44:** 245–249. 1922.—Tests on bark from young trees (35–40 years) grown in Bavaria showed 10–18 per cent tannin, with a high sugar content. The tannin content was highest for bark free from the thick corky layer found on older trees. Sheep and goat leather tanned with this material indicated that it has properties intermediate between those of spruce and oak barks. It is suggested that extension of the area planted to Douglas fir may eventually result in a valuable source of raw material for the leather industry.—*W. N. Sparhawk.*

3931. Petri, L. **Ricerche sperimentali sul trattamento elettrico del legno. [Experimental studies on the electrical treatment of wood.]** Ann. R. Ist. Superiore Forest. Firenze **6:** 23–141. *Pl. 1 (col.), fig. 1–20.* 1920–1921.—This article treats of the use of the electric current in securing rapid penetration of preservative solutions. Laboratory methods and results are discussed.—*Ferdinand W. Haasis.*

3932. Planke. **Samenerzeugung geharzter Föhren. [Seed production of pines tapped for resin.]** Forstwiss. Centralbl. **44:** 172–175. 1922.—Cones of untapped trees (*Pinus silvestris*) averaged 50 per cent heavier and contained 44 per cent more seed; also, seed from untapped trees weighed 30 per cent more than those from tapped trees, and had a percentage germination of 82.5 as compared with 64.5 for seed from tapped trees. The cones, seed, and seedlings from tapped and untapped trees differ in appearance.—*W. N. Sparhawk.*

3933. Pratt, Joseph Hyde. **Biennial report of the state geologist 1919–1920.** Bienn. Rept. North Carolina Geol. and Econ. Surv. **1919/20:** 15–27. 1922.—The forestry activities are handled by the Forestry Division, the report of which is summarized under the following captions: demand for timber, present condition, forest fire statistics, protection of watersheds, wood-using industries, study of southern pines, chestnut bark disease, North Carolina Forestry Association, work of the U. S. Forest Service in North Carolina during 1919–1920, and suggested forestry legislation.—*C. F. Korstian.*

3934. Preller. **Kiefernkultur und anderes aus der Kassubei. [Pine culture.]** Deutsch. Forstzeitg. 37: 913–917. 1922.—The author describes methods of establishing pine stands on waste lands. Where scattered seed trees were present and the vegetation cover not too dense, satisfactory results were obtained by harrowing strips among and near them. Broadcast seeding on plowed and harrowed land was successful, as were spot-sowing in furrows and planting of cones in furrows. Broadcast seeding immediately following burning off of the brush cover was not successful. Planting on shifting sands is also described, and it is stated that *Pinus banksiana* did not do as well as the native *P. silvestris*.—*W. N. Sparhawk.*

3935. Puchner, H. **Die verzögerte Keimung von Baumsämereien. [Delayed germination of tree seeds.]** Forstwiss. Centralbl. 44: 445–455. 1922.—Germination tests of 100 *Fraxinus excelsior pendula* seed picked from the tree and freed from the husks, and of 100 similar seed dried at 35°C. for 6 weeks, yielded practically identical results. The first seed germinated in 5 months, while germination continued for 6 years, at the end of which 34 undried and 36 dried seed had sprouted. In similar tests of unopened fruits, 7 and 6 per cent, respectively, germinated within 7 years. The 1st undried fruit sprouted in 20 months, the 1st dried one in 2 years. Free seed of *Tilia europea parvifolia* began to germinate in 15 months, and the last one germinated near the end of the 7th year; 14 per cent germinated altogether. Of 100 whole fruits of linden, all decayed without germinating, and of 100 fruits in which a small groove was cut only 1 germinated, after 5 years. These tests indicate the desirability of removing the seed from the fruit in sowing ash, and the futility of sowing whole fruits of linden in any case.—*W. N. Sparhawk.*

3936. Riemenschneider. **Die Folgen der Trockenheit von 1921. [Results of the 1921 drought.]** Deutsch. Forstzeitg. 37: 606. 1922.—Oak, hornbeam, pine, larch, silver fir, and Douglas fir showed little ill effects. Beech and spruce were seriously injured, putting out but little foliage in 1922 and many trees dying.—*W. N. Sparhawk.*

3937. Sch. **Die Nonnenkalamität. [The nun-moth calamity.]** Deutsch. Forstzeitg. 37: 752. 1922.—Beginning in 1919, Central European spruce forests have suffered greatly. In Czechoslovakia 7,000 hectares of spruce have been killed, on 10,800 hectares over 50 per cent of the trees were killed, on 20,000 hectares 25–50 per cent, and on 45,000 hectares less than 25 per cent. The infestation has spread into Bavaria, Saxony, and Silesia, and is still advancing.—*W. N. Sparhawk.*

3938. Sch. **Ungarns Forstpolitik. [Forest policy of Hungary.]** Deutsch. Forstzeitg. 37: 991. 1922.—The Hungarian government has submitted 6 forestry laws to the National Assembly: (1) creating a special fund to promote forestry, afforestation, and technical literature; (2) empowering certain credit institutions to lend money on forest properties; (3) creating a forestry bureau; (4) organizing the forest admnistration under the department of agriculture; (5) promoting increased production and afforestation; (6) encouraging associations of forest workers.—*W. N. Sparhawk.*

3939. Sch. **Verstaatlichung des grossen Privatwaldbesitzes in der Tschechoslowakei. [State expropriation of private forests in Czechoslovakia.]** Deutsch. Forstzeitg. 37: 606. 1922.—The Czechoslovakian government takes over, on Jan. 1, 1923, the approximately 300,000 hectares of private forests in the mountain districts near the boundaries, paying the owners pre-war values. This measure is adopted to put an end to trade between Germany and the German forest owners in Czechoslovakia, to increase the state resources, and to give the state control of a zone along its borders.—*W. N. Sparhawk.*

3940. Schmidt, Andr. **Die Seekiefer (Sternkiefer, Igelföhre). [The maritime pine.]** Forstwiss. Centralbl. 44: 265–269. 1922.—After the failure of attempts to grow *P. maritima* or *P. pinaster* in the Palatinate some 65 years ago, foresters generally agreed that the species was not suited to that part of Germany because of its susceptibility to frost. Many surviving

plantations indicate that not only was this idea wrong, but that maritime pine on very poor soils is far superior to the native *Pinus silvestris*. Results of stem analyses of average trees of the 2 species grown in mixture show a volume per tree of from 4 to 17 times as great in the maritime pine. It is suggested that a frost-hardy strain may be developed by careful selection.—*W. N. Sparhawk.*

3941. Schmiedebach, O. **Die Tachymetrie in Walde.** [Tachometry in the forest.] Zeitschr. Forst.- u. Jagdw. 54: 110–111. 1922.—The 3 principal tachometric methods and their applicability are briefly discussed. The most suitable instrument will consist of a small, light theodolite, with a stadia telescope for measuring distance, a gradient circle, and an attachable compass.—*J. Roeser.*

3942. Schnider. **Die Bodenbonitierung und Klassenbildung für die bayerische Grundsteuer und deren geschichtliche Entwicklung.** [Soil valuation and classification for purposes of the Bavarian land tax.] Forstwiss. Centralbl. 44: 175-184; 224-232. 1922.—In theory, land of all classes was to be taxed on the basis of its average net yield, reduced to common terms of money value. Because of the wide variation in costs, and the absence of reliable data on yields and costs over a period of years, such classification was not possible. Instead, assessments were based on relative gross yields, reduced to terms of $\frac{1}{8}$ bushels of rye. This method was applied to pasture and forest lands as well as to cultivated land.—*W. N. Sparhawk.*

3943. Schubert. **Über die Schattenfestigkeit der Holzarten.** [Concerning the shade tolerance of trees.] Forstwiss. Centralbl. 44: 285–290. 1922.—Starting with Wagner's theory that differences in tolerance of trees are due to differences in ability to absorb and utilize light of the shorter wave lengths, and pointing out that the most tolerant species, beech and fir, occur on limestone soils, Schubert advances the theory that it is the fluorescence of calcium salts which increases the tolerance of trees on soils containing lime. The rays from the red part of the spectrum are most favorable to assimilation and plant growth, while the ultra-violet rays either do not favor growth or actually retard it. Crystals of several calcium compounds, such as calcite, dolomite, aragonite, apatite, and wollastonite, show red fluorescence, converting ultra-violet rays into red rays. If it is true, as suspected, that calcium oxalate crystals, which are abundant in the foliage and bark of trees, also have red fluorescence, this will explain the greater tolerance of trees on limestone soils, and also the more thrifty growth of trees as well as of other vegetation on such soils. Moreover, Stoklasa has shown that calcium is one of the constituents of chlorophyll. Schubert suggests the desirability investigating whether calcium oxalate exhibits red fluorescence, as calcium carbonlates and phosphates are known to do.—*W. N. Sparhawk.*

3944. Schüpfer. **Wuchsleistungen von Pseudotsuga Douglasii.** [Growth of Doulgas fir.] Forstwiss. Centralbl. 44: 205–214. *2 fig.* 1922.—Results of measurements on permanent sample plots in Bavaria are given in detail; 36-year-old stands showed an enormous increment during the last 5-year period, amounting to 35.96 cubic m. per hectare per annum, single trees having a volume of over 1 cubic m. It is not known how satisfactory the wood will prove for general construction, as only small trees have been cut. Douglas fir is less wind-firm than native species. Its culture is recommended on limited areas protected from wind.—*W. N. Sparhawk.*

3945. Schwappach. **Das bayerische Gesetz über die Aufforstung landwirtschaftlichen Grundstücke, vom 22 December, 1921.** [Bavarian law of December 22, 1921, regarding afforestation of agricultural land.] Deutsch. Forstzeitg. 37: 532–533. 1922.—Land used for agriculture may be devoted to timber growing only with permission of local officials. An owner may afforest small adjoining tracts without a permit, but must notify the proper authorities. Permits are granted only in cases where soil, climate, or location make the land better suited for forests than for agricultural crops, or if the forest is needed for a bird refuge or for protection of slopes or watercourses.—*W. N. Sparhawk.*

3946. Sieber, Ph. **Die Birke (Betula verrucosa). [The birch.]** Forstwiss. Centralbl. **45:** 12–18. 1923.—A plea is made for the greater appreciation of the birch as it reproduces abundantly, grows rapidly, and is useful in all sizes. It is especially well adapted to restock bare areas as a forerunner of more valuable species.—*W. N. Sparhawk.*

3947. Stoate, T. N. **Sylvicultural notes: Pinus insignis.** Australian Forest. Jour. **5:** 102–104, 125–126. 1922.—Insect pests of the nursery and plantations, and utilization are discussed.—*C. F. Korstian.*

3948. Vaile, E. Earle. **Some experiments in afforestation on the Waiotapu-taupo-plains.** New Zealand Jour. Agric. **25:** 359–363. 1922.—More than 40 species have been planted. For timber purposes *Pinus insignis, Eucalyptus Macarthuri, E. viminalis, E. Gunnii, E. acervula,* and *Pseudotsuga Douglasii* are recommended. Natural afforestation is taking place wherever there is opportunity. Forest fires are a serious menace.—*N. J. Giddings.*

3949. Weiss, L. **Heinrich Zschokkes Einfluss auf die französischen Ödlandaufforstungen. [Zschokke's influence on the reforestation of waste lands in France.]** Forstwiss. Centralbl. **44:** 455–462. 1922.—The early history of the reclamation is discussed briefly. The methods and species (maritime pine) finally used were those recommended by Zschokke.—*W. N. Sparhawk.*

3950. White, C. T. **Botanical notes on Queensland forests.** Australian Forest. Jour. **5:** 147–149. 1922.—A note is presented on the forest conditions of the Russell River and Bellenden-Ker Ranges, northeastern Queensland, together with a list of the important trees grouped by families.—*C. F. Korstian.*

3951. Wilson, Robert, and F. E. Coff. **Development of cooperative shelter-belt demonstrations on the northern great plains.** U. S. Dept. Agric. Bull. 1113. *27 p., 15 fig.* 1923.—Objects of this cooperation are to stimulate interest in the improvement of farm homes by planting belts of trees about farm buildings in the northern Great Plains region, and to demonstrate by actual trial the species of trees best adapted to the different sections of this region. Results are based on 1,234 cooperation demonstrations (nearly 1½ million trees) over a 5-year period, of which 716 plantings are still growing. Box-elder, green ash, white elm, and caragana were most extensively tested and seem best adapted to the climatic conditions generally prevailing. Northwest poplar, chokecherry, buffalo berry, Russian olive, Black Hills spruce, white spruce, blue spruce, Scotch pine, and jack pine, less extensively tested, give promise of being suitable for general planting. Norway poplar, Carolina poplar, Russian golden willow, and laural leaf willow are not adapted to general planting. Methods of planting, cultivating, pruning, and precautions against animal and insect damage are discussed. A standard spacing distance has not yet been determined. Box-elder, green ash, and white elm were much more hardy when stock was raised from seed gathered from native trees than the more southern and eastern strains. Evidence is conclusive that it is possible to start successfully a planting of trees on the average upland farm site in this region, and future results will show whether or not these plantings will maintain themselves after attaining their maximum growth.—*J. T. Buchholz.*

3952. Wimmer. **Der Bestandsbegriff in seiner Bedeutung für Theorie und Praxis des Waldbaues. [Significance of the "stand" concept in silvicultural theory and practice.]** Forstwiss. Centralbl. **44:** 371–380. 1922.—This is largely a discussion of the characteristics of various silvicultural systems. The writer concludes that theory and practice of silviculture and also of forest regulation must be based, not on the individual tree or the whole forest, but on the stand.—*W. N. Sparhawk.*

GENETICS

Orland E. White, *Editor*

(See also in this issue Entries 3726, 3738, 3743, 3745, 3750, 3758, 3780, 3782, 3792, 3813, 3830, 3924, 4052, 4056, 4063, 4072, 4075, 4092, 4109, 4116, 4136, 4139, 4260, 4274, 4299, 4560, 4574, 4575, 4603, 4674)

3953. Anonymous. [German rev. of: Waldron, L. R. **The inheritance of rust resistance in a family derived from a cross between durum and common wheat.** North Dakota Agric. Exp. Sta. Bull. 147. *24 p., 2 fig.* 1921 (see Bot. Absts. 9, Entry 279).] Zeitschr. Pflanzenzücht. **8:** 443–444. 1922.

3954. Anonymous. [German rev. of: Witte, H. **Einige Beobachtungen über die Samenfarben des Rotklees und ihre Erblichkeit.** (**Observations on the seed colors of red clovers and their inheritance.**) Sveriges Utsädesför. Tidskr. **30:** 257–265. 1920.] Zeitschr. Pflanzenzücht. **8:** 444. 1922.

3955. Anonymous. [German rev. of: Witte, H. **Luzernförädling.** (**Alfalfa investigations.**) Sveriges Utsädesför. Tidskr. **31:** 165–200. 1921.] Zeitschr. Pflanzenzücht. **8:** 445. 1922.

3956. Allen, C. L. **Effect of the age of sire and dam on the quality of offspring in dairy cows.** Jour. Heredity **13:** 167–176. *6 fig.* 1922.—This study of the production records of Holstein-Friesian cows shows that there is no significant difference between the average age of the parentage of groups of high producing and comparatively low producing cows respectively; in fact, the dams of the high producers are on the average the younger. Some of the very highest producers were born from very immature parents.—Bulls as a rule are kept less than 4 years, and if they produce better daughters when aged, it is usually due to the fact that they are bred to better cows. This does not detract from the fact that the proven sire is much more desirable than the untried one.—The young from very immature or very old parents are as valuable as any. A 1st calf or a calf born in waning years is as valuable as a calf born in the prime of life.—Cows were found to reach their highest productive capacity on the average at about 6 years of age.—*R. C. Cook.*

3957. Allen, W. H. **Selection of breeders without the trap nest.** New Jersey Agric. Exp. Sta. Hints to Poultrymen **11:** 1–4. 1922.—October is considered the best time to select breeding hens without the use of trap nests. Selection may be based largely on physical characterisitcs such as weight, body capacity, health, and quality. The past production of the hen may be judged largely by the pigmentation of the vent, ear lobes, beak, and shanks. The time of molting is also considered and late molting is a very desirable trait. The progeny test is recommended as a basis for selecting breeding males. Pedigreed males may be purchased from other breeders to be used in flocks not trap nested.—*F. A. Hays.*

3958. Alverdes, F. [German rev. of: Plate, L. **Allgemeine Zoologie und Abstammungslehre.** [**General zoology and genetics.**] *vi + 629 p., 557 fig.* Gustav Fischer: Jena, 1922.] Zeitschr. Indukt. Abstamm.- u. Vererb. **30:** 138–139. 1922.

3959. Arisz, W. H. **Selectie van Hevea.** [**Selection in Hevea.**] Arch. Rubbercult. **5:** 475–485. 1921.—The author considers it unnecessary to isolate pure lines of *Hevea brasiliensis* and advocates the use of F_1 hybrids. Vegetative reproduction as a means of improvement is discussed.—*C. D. LaRue.*

3960. Bemmelen, J. F., van. **Wing-design of mimetic butterflies.** Proc. Roy. Acad. Amsterdam **23:** 877–886. 1922.—Mimetic resemblances do not come under one general law; each must be explained individually. Real mimicry is rare and of chance origin. Excluding from consideration possible usefulness of mimetic forms and studying them from a purely morphological standpoint, mimetic patterns do not differ essentially from non-mimetic. The

author tries "to reconstruct the original common genus or family type" by comparative studies, judging by the markings of both mimetic and non-mimetic members of the group. "All the elements which enter into the composition of the pattern of mimetic forms can be traced back to those of their non-mimetic congeners," and are characteristic of the group as a whole.—The aberrant slender wings of mimetic Dismorphias, though unlike the common type in butterflies, are probably primitive, cf. Sphingids, Hepialids, as well as Trichoptera, Neuroptera, Odenata. Mimic and model simply retain the ancient form. Their spotted pattern likewise may be more primitive than the white or yellow self colors of common Pierids.—Analysis of the case of *Papilio dardanus* shows that its several different mimetic females are more primitive in coloration and form of wings than the male type. Wing tails and suffusion of the wing with yellow, characteristic of the male, are relatively recent acquisitions. Taillessness and extension of black markings, characteristic of the mimetic females, are primitive. Several "non-mimetic" female varieties resemble these females more than they do the male.—Since every detail in the pattern of mimetic forms is one of the hereditary features of the group (genus, family, or order), "there is no reason left for ascribing the total effect of the combination of all these details to the influence of protective mimicry" through natural selection. "Polymorphic females may profit by their accidental likeness to unpalatable forms, * * but this profit can merely be a consequence of a casual similarity, never its cause.—*J. H. Gerould.*

3961. Blaringhem, L. **Sur l'hérédité du sexe chez la Lychnide dioique (Lychnis vespertina Sibthrop). [The inheritance of sex in dioecious Lychnids.]** Compt. Rend. Acad. Sci. Paris **174:** 1429–1431. 1922.—*Lychnis vespertina* crossed by *L. sylvestre*, *L. rubrum*, and *L. vespertina* gave 99, 96, and 95 per cent pistillate plants respectively. Rose colored and white flowered plants of the 1st cross, back-crossed by the same plants used as seed parent, gave a total of 423 pistillate and 472 staminate plants. The progenies of individual plants varied from 31 to 66 per cent of pistillate plants with no relation between flower color and sex.—*D. F. Jones.*

3962. Bluhm, Agnes. [German rev. of: Harrison, J. W. H. **A preliminary study of the effects of administering ethyl alcohol to the lepidopterous insect Selinia bilunaria with particular reference to the offspring.** Jour. Genetics **9:** 39–52. 1919.] Arch. Rass.- u. Ges. Biol. **14:** 356–357. 1922.

3963. Clark, A. H. **Animal evolution.** Proc. Nation. Acad. Sci. [U. S. A.] **8:** 219–225. 1922.—The radially symmetrical colonial coelenterates represent the highest degree of purely biological perfection, and all other animals (except the sponges) are derived from them through the appearance of various defects which had the anomalous result of leading to increased bodily efficiency.—*D. F. Jones.*

3964. Clausen, Roy E. **Inheritance in Drosophila hydei. I. White and vermilion eye-colors.** Amer. Nat. **57:** 52–58. 1923.—Two sex linked mutants—white and vermilion—have been isolated in *Drosophila hydei* which appear to be parallel with the similar mutants in *D. melanogaster* and in *D. obscura*. The percentage of crossing over between them is 9.3 as compared with 30.5 in *D. melanogaster* and 8.0 in *D. obscura*. With the mutants described by Hyde, 2 of the 6 linkage groups expected, because of the 6 pairs of chromosomes in *D. hydei*, are thus known. Non-disjunction appeared in the case of 1 male, which was completely sterile. It was probably an XO male, which is sterile in *D. melanogaster*.—*H. H. Plough*

3965. Cole, Leon J. **Chanticler poultry.** Jour. Heredity **13:** 147–152. *3 fig.* 1922.—At the Institute Agricole d'Oka, Province of Quebec, Canada, the poultry husbandman, Brother Wilfred, a Trappist monk, undertook the "creation" of a purely Canadian breed of poultry. "Fancy" characters were to be eliminated and the breed was to be a general purpose one. The color decided on was white, and the plumage was to be heavy enough to offer maximum protection during the Canadian winter, and the comb and wattles were to be

reduced to a minimum to reduce the chances of freezing. In making his new breed he used the obvious method of mixing together the available ingredients and "sifting out the desired ones with the sieve of selection." He made his first crosses in 1908, a dark Cornish being bred to white Leghorn hens and a Rhode Island red to white Wyandottes. In succeeding years various crosses were made, with selection toward the desired type. By 1920 the uniformity of the breed had become such that it was recognized by the American Poultry Association and admitted to a place in the "standard of Perfection."—*R. C. Cook.*

3966. Czuber, E. **Zur Frage der Anwendbarkeit der Wahrscheinlichkeitsrechnung auf landwirtschaftliche Versuche.** [The question of the application of the theory of probabilities to agricultural investigations.] Zeitschr. Pflanzenzücht. 8: 331–339. 1922.—The author discusses the application of simple biometric methods, the arithmetical mean, standard deviation, standard deviation of mean, and standard deviation of the difference of means, in agricultural data. He criticizes the use of certain more complex methods of analysis.—*Sewall Wright.*

3967. Daniel, Lucien. **Hyperbioses de Soleil et de Topinambour.** [Hyperbiose grafts of Helianthus annuus on Helianthus tuberosus.] Compt. Rend. Acad. Sci. Paris 175: 984–985. 1922.—A scion of sunflower is grafted upon a stock of *Helianthus tuberosus.* Later a scion of *H. tuberosus* is grafted upon this scion of sunflower. *H. tuberosus* is refered to as the hypobiont and the hyperbiont and sunflower is the mesobiont. The hyperbionts differ in vigor and branching, and resist very unequally the environmental conditions. Tuberization of the hypobiont is more intense than in ordinary grafts, i.e., olobiosis of *H. annuus* on *H. tuberosus,* but the crop is not so large. It did not exceed 400 gm., whereas in olobiosis it is 700 gm., in olohyperbiosis 2,050 gm., and in hemihyperbiosis 800–975 gm. A study is also made of the distribution of inulin in these grafts. None is found in the *H. annuus* as a mesobiont.—*C. H. Farr.*

3968. Davis, B. M. **An attempt to improve through selection the style length and fertility of Oenothera brevistylis.** Genetics 7: 590–596. 1922.—For 5 generations of *Oenothera brevistylis,* a short-styled mutation of *O. Lamarckiana,* selection toward increased length of style was practised, those plants being chosen as parents which produced the highest percentage of flowers with increased style length, except when sterility (a high degree of which is correlated with the short style of *O. brevistylis*) prevented such procedure. Selection failed to hold the gains made by individual plants; though the short style is inherited, the variations back toward normal style length are apparently not due to inherited factors.—*Frieda Cobb Blanchard.*

3969. Dublin, Louis I. **The higher education of women and race betterment.** 2nd Internat. Congress Eugenics. Vol. II. Eugenics in race and state. *p. 374–385.* Williams & Wilkins Co.: Baltimore, 1923.—The higher education of women should be a powerful influence for race betterment; practically, it has not worked that way. It is a common criticism of women's colleges that they educate students away from normal home interests and, in place of these, develop other interests which are, in a sense, antagonistic. A relatively small proportion of college women marry and, when married, bear but few children. For this disgenic tendency the kind of education women receive is largely responsible. It is pointed out also that college women are very often unprepared to assume their obligations in the community effort for social betterment. They are not always aware of the importance of the social movements which promise so much in the solution of community problems. To meet this situation the writer recommends a change in the curriculum of women's colleges. He has emphasized a programme of scientific construction covering the entire 4-year period, of which the central theme is the biological sciences, with especial reference to personal and community hygiene. The courses follow one another beginning with those in physics and chemistry and general biology, through physiology and hygiene, community hygiene, as included under such headings as, bacteriology, sanitation, vital statistics, and the administration of

public health departments. It is one of the advantages of this plan that it has unity; that it covers a field of study that has the greatest possible bearing on the immediate needs of the students themselves; that it gives added opportunities for cooperation to most of the departments of the college; that it makes all departments conscious of the part they are to play in a larger programme; and that it ties up the college activities to those in the community along lines considered of the greatest importance in modern life. The author has had in mind, throughout, the development of such interest on the part of the students as will attract them to the activities of home life as a personal ideal. It will develop a confidence to participate in the constructive community activities. Special emphasis is placed upon such work as public health, especially as it affects schools, care of mothers and children, and the Americanization of the foreign born. It is assumed that the young college woman who has had the advantages of such courses as are outlined will be ready to serve these movements with technical direction and, in any case, with sympathy and understanding.—*Louis I. Dublin.*

3970. East, E. M. **As genetics comes of age.** Jour. Heredity 13: 207–214. 1922.—The author reviews what has been done in genetics since the rediscovery of Mendel's data in 1901. This is compared with the beliefs prevailing since ancient times regarding the inheritance of characters. The article presents no new facts but summarizes the work that has been done in genetics since that science began.—*R. C. Cook.*

3971. East, E. M. **Population in relation to agriculture.** 2nd Internat. Congress Eugenics. Vol. II. Eugenics in race and state. *p. 215–232.* Williams & Wilkins Co.: Baltimore, 1923.—The author discusses phases of the problem of assuring an adequate future food supply for the growing population of the world, presenting estimates of the world population, rate of increase, total land area, arable land area, and area now being farmed, and discussing the possibility of increase in production per acre, the possibility of discovering new foods, the problems of soil fertility, and problems of an agricultural policy. But even with solution for all these difficult problems, "no matter how great the heights of human genius in providing for future generations the present rate of population increase cannot continue indefinitely."—*Sylvia L. Parker.*

3972. Enriques, Paolo. **Hologynic heredity.** Genetics 7: 583–589. *2 fig.* 1922.—The name diagynic heredity is proposed for the typical sex-linkage of the XX-XY type and diaandric heredity for the WZ-ZZ type. Hologynic heredity is proposed for a new type of inheritance where transmission is direct from mother to daughter, the sons not being affected. Pedigrees showing the hologynic inheritance of hemophilia and cataract of the eye are given. A case of holoandric heredity is cited, transmission being from father to son, the daughters not being affected. An explanation is offered which makes use of selective fertilization.—*J. L. Collins.*

3973. Fetscher, R. **Ein Stammbaum mit Spalthand. [A "cleft-hand" pedigree.]** Arch. Rass.- u. Ges.-Biol. 14: 176–177. 1922.—A mentally normal boy with bilateral "cleft-hand" has 1 epileptic and 3 normal sibs; parents, uncles, and aunts are all normal. The paternal grandfather, however, showed evidence of mental aberration and 1 of his nephews has "cleft-hand." The author is inclined to ascribe these physical and mental anomalies to the same cause, possibly a recessive Mendelian factor.—*C. H. Danforth.*

3974. Fetscher, R. **Über die Erblichkeit des angeborenen Klumpfusses. [On the heredity of congenital club foot.]** Arch. Rass.- u. Ges. Biol. 14: 140–158. 1922.—Club foot is hereditary in ½–¾ of all cases and depends primarily on nervous causes. Families in which the trait appears show a somewhat increased number of bodily defects and a greatly increased frequency of mental disturbances; infant mortality is high.—*C. H. Danforth.*

3975. Goodale, H. D., and Ruby Sanborn. **Changes in egg production in the Station flock.** Massachusetts Agric. Exp. Sta. Bull. 211. *99–125. 16 fig.* 1922.—Results of 8 years'

work in breeding Rhode Island Red poultry for egg production are reported. The working hypothesis assumes that 5 main characteristics are concerned in annual egg production. These characteristics are called maturity, rate, broodiness, persistency, and winter pause. The age at 1st egg has been reduced to an average of below 200 days. Some families have been developed that are practically free from broodiness. Progress has also been made in eliminating the winter pause and also in increasing the percentage of birds showing high rate. Special attention has not been given to persistency. Standards for selection became more rigid as the work progressed. Particular attention was paid to the size of the family in selecting both male and female breeders. The average winter egg production has advanced from 36.70 to 67.3 eggs; the average annual egg yield, from 145.41 to 200.98 eggs at the close of 1921.—*F. A. Hays.*

3976. Gowen, Marie S., and John W. Gowen. **Complete linkage in Drosophila melanogaster.** Amer. Nat. 56: 286–288. 1922.—In 1917 a stock appeared which showed no crossing over in the sex chromosome. This has been continued to date, and shows complete linkage, i.e., absence of crossing over in the 2nd and 3rd chromosomes as well. The condition is stated to be genetic, and the gene is believed to be recessive, located in the dichaete-hairless region of the 3rd chromosome. The females in this stock thus show the same complete linkage which is the rule for males.—*H. H. Plough.*

3977. Griffee, F. **Breeding oats resistant to stem rust.** Jour. Heredity 13: 187–190. *3 fig.* 1922.—The method used for differentating heterozygous and homozygous F_2 plants in breeding for rust resistance, when resistance is a dominant character, is to grow in the greenhouse F_3 seedling families from each resistant F_2 plant. These seedlings are inoculated with rust and from their reaction the F_2 plants which are homozygous for resistance are determined. In breeding oats resistant to stem rust, 192 of the 567 F_3 seedling families tested bred true for resistance.—*Fred Griffee.*

3978. Heinricher, E. **Kreuzungsversuche zwischen Viscum album L. und V. cruciatum Sieb. [Crossing experiments between Viscum album and V. cruciatum.]** Ber. Deutsch. Bot. Ges. 40: 174–177. 1922.—*Viscum cruciatum* pollinated with *V. album* did not set fruit while the reciprocal cross yielded some fruits, which resembled those of *V. album* but which the author suggests may be the result of close pollination by pollen from staminate plants of *V. album* in the same vicinity. Von Tubeuf's statement that these 2 species of *Viscum* hybridize could not be verified. The results of the author's experiments with mistletoes lead him to conclude that anemophily is more general than entomophily.—*W. C. Muenscher.*

3979. Heribert-Nilsson, N. **Experimentelle Studien über Variabilität, Spaltung, Artbildung und Evolution in der Gattung Salix. [Experimental studies in variability, splitting, species formation, and evolution in the genus Salix.]** Lunds. Univ. Arsskr. 14: *145 p., 65 fig.* 1918.—The author approached the problem of splitting in hybrids in the genus *Salix* because Wichura's results were not clear. He grew a large 2nd generation of hybrid *S. viminalis* × *S. caprea*. General habit of growth showed variations in height, mechanical structure and branching; some plants were intermediate, some like one parent, and some like the other. Some leaves were noticeably larger and some smaller than those of the parents and F_1; the shape was intermediate in various degrees. All degrees of intermediacy were shown in regard to color, glossiness, and hairiness, and a greater range of variability than appeared in the parents. Of 150 specimens, 70 per cent were apparently like F_1. The remainder belonged in 1 of 3 types: (1) resembling one species in some respects and the other in others; (2) resembling one of the parents decidedly; (3) differing decidedly from both parents. Mendelian splitting occurs in connection with leaf form, involving not more than 4 hereditary factors. Length of leaf and width split independently. More individuals are like *S. caprea* in leaf width than like *S. viminalis*, indicating more factors for width than for length. *S. caprea* has 2 polymerous (polymere) factors for leaf width, *S. viminalis*, 1 for leaf length. These factors also influence

leaf color, height of shrub, and periodicity. This is considered proof that the most fundamental species-characters Mendelize. Back-cross (*S. viminalis* × *S. caprea*) × *S. viminalis* confirmed the author's assumption of the factorial constitution of the species. Hairiness splits in a more complicated way than fundamental habit characters. Pubescence of stamens, form of catkin and time of blossoming, resistance to *Melampsora* and winter killing are characters governed by other factors. *S. viminalis* × *S. daphnoides* shows splitting and segregation of the most fundamental physiological and morphological characters. The species difference is genotypically simpler than between *S. viminalis* and *S. caprea*. Numerous back-crosses confirm the assumption made in accordance with the Mendelian theory that range of variability of a back-cross can lie only between the F_1 and the back-cross parent, that the majority are intermediate and thus phenotypically resemble the parent. Primary hybrids were obtained where the number of individuals was not too small. Crosses between the hybrid and the 3rd species result variously, depending on the factorial constitution; all are variable. (*S. cinerea* × *S. purpurea*) × *S. caprea* and *S. aurita* × (*S. repens* × *S. viminalis*) showed less variability than F_2. (*S. viminalis* × *S. caprea*) × *S. cinerea*, and (*S. viminalis* × *S. caprea*) × *S. aurita* showed as much variability as F_2. Crosses between 2 hybrids show greater variability than F_1 cross and if 1 parent is common to both hybrids, it will reappear in the progeny of the hybrid cross. Crosses between complicated hybrid combinations show the greatest resemblance to the species last used in the combination. The author secured 2 combinations in which there were 6 species; Wichura had 1 in which there were 7. Sterility does not increase with degree of complication. The usual 1: 1 ratio of sexes was greatly modified in some crosses. Mosaic forms were found at times. Many cases were encountered in which great phenotypic variability in hybrid progeny could be traced back to an unexpectedly simple factorial system. Difference between species and variety characters is morphological, not genotypical, hence reduced to a question of nomenclature. What seem like new species are often but the expression of a new combination of factors. Genotype formation through crossing is the cause of variability. Varieties of species must be as old as species, not developed from them, as Darwin thought. Species of systematists arise in distinct morphological entities resulting from combinations of splitting factors of 2 species. Formation of new genes has not been established experimentally. Loss of genes is questionable; an evolutionary theory built on the idea of mutants arising through loss of genes would be untenable.—*Helen D. Hill.*

3980. Hildén, Kaarlo. **Über die Form des Ohrläppchens beim Menschen und ihre Abhängigkeit von Erbanlagen. [On the form of the ear lobes in man and their relation to heredity.]** Hereditas 3: 351–357. 1922.—Except for the aged, the ill, and the newborn, all the inhabitants of Runo, an isolated island, were examined as to the form of ear lobes. Two categories are recognized, the free and the adherent. Of the former there were 168 cases; of the latter, 89. While there was occasional difficulty in diagnosis, the author, unlike Carrier, found no exception to the rule that the free type of ear lobe behaves as a simple dominant trait, the adherent form being recessive.—*C. H. Danforth.*

3981. Hoffman, F. L. **Race amalgamation in Hawaii.** 2nd Internat. Congress Eugenics. Vol. II. Eugenics in race and state. *p. 90–108.* Williams & Wilkins Co.: Baltimore, 1923.—A study is reported of 22,388 death certificates of decedents in the Territory of Hawaii, 1910–1915, with especial reference to the correlation of father's birthplace and mother's birthplace with birthplace of the subject. Racial affinities of parents were inferred from their place of birth. The summarized data are given from which the following may be emphasized: (1) Of 20,631 mothers, 7,442 were born in Hawaii, 7,269 in Japan, 1,597 in Portugal, 1,358 in China; and the remaining 14.4 per cent in the Philippines, Porto Rico, Spain, U. S. A., Korea, Germany, and elsewhere, in the order named. (2) The percentage of subjects of whose parents both were born in same country was Chinese 78.3, English 48.6, Hawaiians 98.2, Japanese 99, Filipinos 97.5, Portuguese 85.8, Americans 66.8. It is concluded that "racial intermixture in the Hawaiian Islands is much more restricted than is generally assumed;" that the greatest amount of intermixture is between native Hawaiian women and foreign men, chiefly Chinese,

English, and German. The Japanese, although the second largest racial element in the data, were involved in practically none of the mixed marriages.—*L. C. Dunn.*

3982. Hoffman, F. L. **The problem of negro-white intermixture and intermarriage.** 2nd Internat. Congress Eugenics. Vol. II. Eugenics in race and state. *p. 175–188.* Williams & Wilkins Co.: Baltimore, 1923.—Race intermixture between blacks and whites in the U. S. A. is found to be on the increase. The ratio of mulattoes to the total colored population increased from 11.2 per cent in 1890 to 20.9 per cent in 1910. The ratio and rate of increase of mixed bloods is greatest in the west, least in the south. Data on 8 cases of mixed marriages in St. Paul and Minneapolis are given from which it is concluded that "the white women who have married blacks are of the weaker class either mentally, morally or physically; while conversely the negro men represent the better class in most respects, at least physically and mentally." After some discussion the author condemns all such mixed marriages as disgenic and anti-social.—*L. C. Dunn.*

3983. Hooton, E. A. **Observations and queries as to the effect of race mixture on certain physical characteristics.** 2nd Internat. Congress Eugenics. Vol. II. Eugenics in race and state. *p. 64–74.* Williams & Wilkins Co.: Baltimore, 1923.—This paper presents a physical anthropologist's impressions concerning the use of non-mensurable morphological details as criteria of race or mixture, with remarks on the possibility of analyzing modern races by the study of racial hybrids. Among the specific details considered are: (1) the peculiarly compact bony texture and yellow brown patina characteristic of negroid skulls which appears in the skulls of hybrids between negroids and races lacking this peculiarity; (2) the complex coronal suture of European races which appears to be dominant in crosses with races characterized by simpler sutures; (3) the low broad nasal bridge of negroids and mongloids which considerable evidence indicates is recessive to the leptorrhine (European) type; (4) head form. Mesocephalic races are interpreted generally as hybrid types often showing disharmonic dolicho and brachy features, suggesting separate inheritance of the cranial parts. Conclusions are given from unpublished data on the inheritance of hair form and color, skin pigmentation, etc., in negro-white crosses illustrating the author's thesis that the physical results of racial crosses may be interpreted as due to the inheritance of numerous small units, presumably Mendelian, from each parent race.—*L. C. Dunn.*

3984. Izquierdo, J. Joaquin. **Breve resena genealogica de la familia Izquierdo. [The genealogy of the Izquierdo family.]** 2nd Internat. Congress Eugenics. Vol. I. Eugenics, genetics and the family. *p. 348–373.* Williams & Wilkins Co.: Baltimore, 1923.

3985. Jack, H. W. **Brothers in Rugby football.** Jour. Heredity 13: 161–162. 1922.—This paper affords additional evidence of the hereditary nature of athletic traits in families. Twenty-three sets of 2 or more brothers are considered from the point of view of their ability to play the British game, as judged by expert selection committees; that brothers inherit similar qualities is clearly evident.—*H. W. Jack.*

3986. Jenkin, T. J. **Notes on vivipary in Festuca ovina.** Rept. Bot. Soc. and Exchange Club British Isles 6: 418–431. *1 pl.* 1921 [1922].—Vivipary is shown to be to some extent hereditary and by such seeds as the plant is able to produce.—*G. C. Druce.*

3987. Jones, E. E. **The genetic significance of intra-uterine sex ratios and degenerating fetuses in the cat.** Jour. Heredity 13: 237–239. 1922.—To test Doncaster's hypothesis that occurrence of tortoise shell males in cats and their usual sterility might be due to hormone action as in free-martins in cattle, uteri of pregnant cats were examined. No trace of anastomosis of circulatory systems supplying fetuses was found. Intra-uterine sex ratio in cats was found to be 122.10 ± 8.30. White coat color in cats was thought to have similar action to that found by Little in mice; the hypothesis was tested by comparison of litter size. Mean litter size of white females was 4.08 ± 0.13, that of non-whites 4.48 ± 0.07, the difference being

0.39 ± 0.15, which is 2.71 times the probable error. Records of degenerating embryos show that out of 102 fetuses of white cats, 11, or 10.78 ± 2.07 per cent were degenerating. In non-white females out of 551 fetuses, 25, or 4.54 ± 0.60 per cent were degenerating. The difference is 6.25 ± 2.16, which is 2.89 times the probable error. Recalculation of non-white figures excluding 1 litter considered pathological, shows 21 degenerating out of 547 fetuses, a percentage of 3.84 ± 0.58. The difference between white and non-white then becomes 6.845 ± 2.149, which is 3.2 times the probable error. The author believes that the conclusion is probably warranted that a significantly greater number of degenerating fetuses is found in white than in non-white cats; also that in some white cats, at least, a lethal action of some sort is operative when the factor for white is present even in a simplex condition.—*E. E. Jones.*

3988. Kahn, Eugen. [German rev. of: Entres, Joseph Lothar. **Zur Klinik und Vererbung der Huntingtonschen Chorea.** (On the clinics and heredity of Huntington's chorea.) *149 p.* Julius Springer: Berlin, 1921.] Zeitschr. Indukt. Abstamm.- u. Vererb. **29:** 219. 1922.

3989. Kahn, Eugen. [German rev. of: Hoffman, Hermann. **Die Nachkommenschaft bei endogenen Psychosen. Genealogischcharakterologische Untersuchungen. (Studien über Vererbung geistiger Störungen.)** (The offspring in endogenous psychoses. Genealogical character studies. (Studies on the inheritance of mental disturbances.) Monogr. Gesam. Neurol. u. Psychiatrie 26. *233 p.* Julius Springer: Berlin, 1921.] Zeitschr. Indukt. Abstamm.- u. Vererb. **29:** 144. 1922.

3990. Kahn, Eugen. [German rev. of: Kretschmer, E. **Körperbau und Charakter. Untersuchungen zum Konstitutionsproblem und zur Lehre von den Temperamenten.** (Body-build and character. Investigations of the constitution problem and temperament.) *2nd ed., 195 p., 32 fig.* Julius Springer: Berlin, 1922.] Zeitschr. Indukt. Abstamm.- u. Vererb. **30:** 139–144. 1922.

3991. Key, Wilhelmine E. **Heritable factors in human fitness and their social control. 1.** 2nd Internat. Congress Eugenics. Vol. I. Eugenics, Genetics, and the Family. *p. 405–412.* Williams & Wilkins Co.: Baltimore, 1923.—Since many refinements of method in education and philanthropy tend to encourage the survival of the inherently unfit, the question of a nation's continuing integrity resolves into a nice balance between certain genetic and social forces inherent in the blood lines of its people. Intensive study of family networks shows widely different potentiality of their various lines. Slight differences in planfulness and perseverance in 2 brothers, for example, have been found to initiate a divergence which in a few generations served to place the 2 branches founded by these brothers at opposite extremes of the social scale. Studies of the quantitative variation in such traits and of the ability with number, point to a segregation of factors to produce on the one hand accentuation and on the other progressive degeneration with regard to these traits, according to the types of mating made. The degenerating lines show frequently a very high birthrate; this, together with their tendency to draw to themselves the defective members of other mixed strains, results in centers of degeneracy and defect. This situation emphasizes as one of the chief duties of institutions, a detailed study of the families from which their charges come, with a view of allowing their genetic potentialities due weight in deciding the fate of their cases, and calling for additional state aid in the treatment of the centers of degeneracy and defect as fast as they are uncovered. The abilities known as the aptitudes have also been found to follow blood lines. The personalites, that have led in industry, science, art, and political organization have arisen by a fortunate crossing of able lines. Hitherto this process, at least under the social conditions pertaining in the U.S.A., has seemed to take care of itself. There are however grave indications of change. The dying out of many highly gifted lines, the low fecundity of others are among the signs of this change. The salient social and economic factors involved in the situation are gradually being evaluated. In addition to the means already touched on for correcting the anti-eugenic influences are the following: (1) a return to saner

and simpler standards of living which would make possible the rearing of larger families in middle classes; (2) a campaign of education calculated to foster "the eugenic conscience" among all classes; (3) the encouragement on the part of the numerous foundations, not of celibacy and comparative sterility in their members, but of marrying and rearing families; (4) the concept of service in contrast to that of personal aggrandizement; (5) early and more adequate economic adjustment to render possible early marriage and parenthood; (6) psychological tests supplemented by family history studies to determine the trend of mental and emotional development. These are especially indicated where the child shows delinquent tendencies or bids fair to become unusually brilliant.—*Wilhelmine E. Key.*

3992. Ladebeck, Ernst. **Die Farben einiger Hühnerrassen. [The pigmentation of races of poultry.]** Zeitschr. Indukt. Abstamm.- u. Vererb. **30:** 1–62. *38 fig.* 1922.—A study of color in the following races of poultry is reported: *Gallus bankiva*, Partridge-feathered Italian, Red Sussex, Rhode Island Red, Speckled Sussex, Crollivitz, Barred Rock, and Minorca. The report is divided into 3 sections: (1) morphology of feathers and feather pigment; (2) chemical properties of feather pigments; (3) coloration of comb, earlobes, and shanks. Feather color is found to depend upon color and shape of pigment granules and their distribution. The chemical properties of the pigments are rather extensively reported upon. Yellow pigment of the shanks is classed as a lipochrome. An extensive list of references is given.—*F. A. Hays.*

3993. Lancefield, Rebecca C., and Charles W. Metz. **The sex-linked group of mutant characters in Drosophila willistoni.** Amer. Nat. **56:** 211–241. 1922.—Twenty-eight recessive sex-linked mutant characters are described, and the genetic behavior of this species is shown to be similar to that of *D. melanogaster*. At least 2 of these mutants—yellow and scute—are believed to be parallel mutations, while forked and stubby probably are also. When the genes of the sex chromosome of *D. willistoni* are plotted in a map on the basis of the percentages of crossing over, it appears that yellow and scute are near the middle, while forked and stubby are at one end at 12 and 42 units respectively. The map in *D. melanogaster* shows yellow and scute at one end of the chromosome, with singed and forked 21 and 56.5 units off. Since the X chromosome of *D. melanogaster* is rod-like and that of *D. willistoni* is V-shaped, these facts suggest the interesting conclusion that the X chromosome of the former corresponds to one end only of the same chromosome in the latter.—*H. H. Plough.*

3994. La Rue, Carl D. **Correlation in structure between mother and daughter trees of Hevea.** Arch. Rubbercult. **5:** 567–573. 1921.—Bark thickness and the number of rings of latex vessels were investigated in 1½-year old seedlings of which the female parents only were known. The thickness of bark in the seedlings varied from 0.5 to 3.0 mm., with an average of 1.28 mm. The coefficient of correlation between mother and daughter trees for bark thickness is 0.366 ± 0.106. The number of latex-vessel rings in the seedlings varied from 2 to 11, with an average of 5.9. The table showing the correlation between mother and daughter trees for number of latex-vessel rings indicates that the coefficient of correlation is insignificant. Since the number of latex-vessel rings is one of the most important factors in yield, there is an indication that yield, also, may be little inherited from the mother tree where seed are produced by open pollination. Seed of which both parents are high producers are to be preferred for selection in spite of their increased cost.—*C. D. La Rue.*

3995. Lécaillon, A. **Sur les charactères d'un hybride issu de l'union d'un Canard musqué mâle (Cairina moschata Flem.) et d'une Oie d'Egypte femelle (Chenalopes aegypticus Eyt.). [The characters of a hybrid resulting from the mating of a Canard Muscovy male duck (Cairina moschata) and an Egyptian female goose (Chenalopes aegypticus Eyt.]** Compt. Rend. Acad. Sci. Paris **174:** 68–69. 1922.—The hybrid resulting from the accidental mating possessed upon hatching the yellow color and characteristic odor of the duck. The hybrid was a male and when adult was of large size and carried the body in the upright manner of a goose. It was mute as is the duck. Mating with a female goose which continued for 3 years

proved infertile. In its extended mating habit and its aggressiveness the hybrid was like a goose. The plumage color, in general, resembled dorsally, the duck, and ventrally, the goose; the white feathers of both species were lacking. The red skin and erectile feathers present on the head of the muscovy duck were absent, as were the brown feathers on the face, neck, and breast of the goose. This hybrid had taken characters from both parent species, but it cannot be considered a mosaic.—*H. W. Feldman.*

3996. Lenz-Munchen. [German rev. of: Frets, G. P. **Heredity of headform in man.** *193 p., 16 pl., 9 fig.* Martinus Nijhoff: The Hague, 1921.] Zeitschr. Indukt. Abstamm.- u. Vererb. **29:** 214. 1922.

3997. Lotka, Alfred J. **The stability of the normal age distribution.** Proc. Nation. Acad. Sci. [U. S. A.] **8:** 339–345. *2 fig.* 1922.—Earlier papers by the author have established the fact of a unique age distribution which, in certain circumstances, has the property of perpetuating itself when once set up in a population. This paper offers proof that this age distribution is stable; that is, that a population will spontaneously revert to it after displacement therefrom or will converge to it from an arbitrary initial age distribution.—*Sylvia L. Parker.*

3998. Lotsy, J. P. **La botanique appliquée et l'hybridisme. [Applied botany and hybridism.]** Rev. Bot. Appl. **2:** 313–325. 1922.—The principles of the chromosome theory of heredity are reviewed with mention of the difficulties in analyses caused by heterogamy and linkage. Hybrids are divided into 2 groups, those in which crossing-over occurs and those in which it does not occur. The behavior in Drosophila hybrids is given as typical of the first class. In the 2nd group there are 7 divisions as follows: duplex hybrids, Mendelian hybrids, nuclear chimeras, pseudohybrids, semi-duplex hybrids, pseudo-duplex hybrids, and triplex hybrids. This classification is based upon the behavior of the paternal and maternal haploid chromosomes. A species exemplifying each class is given. The cytological work of Täckholm on *Rosa* and of Belling on *Canna* is considered as evidence for the theory of the origin of species by the hybridization of existing species differing in specific chromosome number.—*J. L. Collins.*

3999. Macdowell, E. C. **The influence of alcohol on the fertility of white rats.** Genetics **7:** 117–141. *7 fig.* 1922.—The fertility of treated animals has been tested by comparisons with full brother-and-sister controls. The results indicate that heavy as well as light doses of alcohol tend to reduce the sizes of litters from treated rats and their descendants. Heavy doses reduce the number of litters produced by the treated rats and increase the number produced by their descendants. The 1st result is interpreted as due to a modification of the germ-plasm; while the 2nd is believed to support the hypothesis that the alcohol has raised the numbers of litters in the 2nd generation through the elimination of the litters in the first generation that bore the less fertile germinal material.—*Herman L. Ibsen.*

4000. Malloch, Walter Scott. **An F_1 species cross between Hordeum vulgare and Hordeum murinum.** Amer. Nat. **55:** 281–285. 1921.—This cross between common cultivated barley and *Hordeum murinum*, a wild barley, had a sheath with a greater circumference than the blade, thus fitting loosely around it. The blade of the 1st leaf was narrow, linear, and spirally twisted with slightly roughened edges. The blade was about $\frac{1}{2}$ inch in width and the plant grew to a height of 4 inches; at this stage the plant died. There was no evidence of nodes. The 2 species differ in a large number of morphological characters. Probably the reaction systems of the 2 species fail to harmonize. There are all degrees of incompatibility of reaction systems in species crosses.—*Walter Scott Malloch.*

4001. Mohr, Otto L. **Ö. Winge's paper on "The interaction between two closely linked lethals in Drosophila as the cause of the apparent constancy of the mutant 'spread.'" A necessary rectification.** Genetics **4:** 457–461. 1922.—The stock which Winge assumed to be spread

and which he obtained from the author was not spread but dichaete. Spread differs from dichaete both morphologically and genetically. The genetic behavior of dichaete has been described by previous Drosophila workers, with whose accounts Winge's is in agreement. The lethal which Winge designates as vit was known to the author, in whose stock of dichaete it arose by mutation. A note by Winge explains how the mistake came to be made. [See Bot. Absts. 12, Entry 4024.]—*Alexander Weinstein.*

4002. Morgan, T. H. **On the mechanism of heredity. (Croonian lecture.)** Proc. Roy. Soc. London, B 94: 162–197. *2 pl., 35 fig.* 1922.—This paper constitutes a general survey of the Drosophilia work showing the genes to be localized in the chromosomes. After reviewing the parallelism between chromosome behavior and the distribution of the genes according to Mendel's 1st and 2nd laws, the author cites Bridges' cases of non-disjunction of the 4th and of the sex chromosomes and Lillian V. Morgan's case of union of the 2 X chromosomes (resulting in 100 per cent non-disjunction) to show that specific characters have, even in abnormal cases, been found identical in distribution with specific chromosomes. He next reviews the parallelism between the cytologically determined constellation of chromosomes and the genetic "maps" of linkage-groups, as found by various workers, first in *Drosophila melanogaster*, and later in *D. simulans*, *D. willistoni*, *D. virilis*, *D. obscura*, the edible pea, and *Clarkia*. The idea of crossing over in its relation to distance along the chromosome is explained, and the evidence from interference concerning the manner of crossing over. It is shown that the cytological evidence for crossing over is inconclusive and that it is not likely that this process occurs at the "strepsinema" stage, as usually figured. The author finally cites the estimates which have been made of the probable maximum diameter that can be assigned to a gene. Dividing sperm head size or chromatin volume by the probable minimum number of genes—as calculated from the relative frequency with which mutations occur in previously known loci (Muller)—the maximum possible gene size turns out to be between 60 and 77$\mu\mu$. But some of the shorter known "map" distances between genes, if proportionated to the size of the chromosomes which the maps represent, would stand for a real distance of only 20$\mu\mu$ (cf. the haemoglobin molecule of 2½$\mu\mu$).—*H. J. Muller.*

4003. Mottet, Seraphim. **La degenerescence de la pomme de terre. [Degeneration of the potato.]** Jour. Soc. Nat. Hort. France 23: 263–268. 1922.—Degeneration of potatoes is attributed to (1) influence of diseases; (2) imperfect adaptation of varieties to soil and climate; (3) depletion of nutritive elements in the soil and the formation of toxins; (4) deterioration of the varieties on account of long continued asexual propagation. The main discussion concerns the last cause. The writer admits that the question is debatable but maintains the affirmative that there is an actual degeneration due to senility; the passing out of culture of many varieties is cited as evidence. The influence of degenerative diseases is acknowledged but is not considered the only cause. The suggestion is made that there may be a relation between smooth, regularly shaped tubers with shallow eyes and degeneration.—*C. H. Myers.*

4004. Muller, H. J. **A simple formula giving the number of individuals required for obtaining one of a given frequency.** Amer. Nat. 57: 66–73. 1923.—The author presents approximate formula, $\log_e F = -\frac{n}{P-\frac{1}{2}}$, for estimating the chance (F) that a given expected frequency of occurrence (1 in P) may still be correct when no individuals of the minority type have appeared among n individuals. Conversely, the formula can be used for calculating the number of individuals (n) which must be obtained in an experiment to be reasonably sure (chance 1–F) that at least one individual of the minority type may appear where the expected frequency is 1 in P.—*Sewall Wright.*

4005. Müller, K. [German rev. of: Puttick, G. P. **The reaction of the F_2 generation of a cross between a common and a durum wheat to two biologic forms of Puccinia graminis.** Phytopath. 11: 205–213. 1921 (see Bot. Absts. 11, Entry 298).] Zeitschr. Pflanzenzücht. 8: 436–437. 1922.

4006. Nelle, Wilhelm. **Die Beschaffenheit des Gebisses bei kongenitalem Myxödem.** [The character of the teeth in congenital myxodem.] *p. 50–57.* Diss. Bonn Univ.: Jena, 1922.

4007. Pearl, Raymond. **Some eugenic aspects of the problem of population.** 2nd Internat. Congress Eugenics. Vol. II. Eugenics in race and state. *p.212–214.* Williams & Wilkins Co.: Baltimore, 1923.—This paper is an abstract of the writer's studies of the population problem, which he states "is a problem only because the globe on which we live is strictly limited in size." It has been found that the population growth of every country so far tried, and also experimental population of fruit flies in a pint milk bottle, follow a smooth and regular curve, of which the mathematical equation has been written. The main characteristics of the curve are that the rate of growth is at first slow, increases to a maximum, and then decreases, the universe finally reaching a saturation point. If this saturation point is to be reached in a few centuries it becomes an important question what kind of people will comprise this population. "Here enters the eugenic phase of the problem * * * Birth control offers the most hopeful outlook but it is beset by many difficulties."—*Sylvia L. Parker.*

4008. Pearl, Raymond, and T. J. LeBlanc. **A further note on the age index of a population.** Proc. Nation. Acad. Sci. [U. S. A.] **8**: 300–303. *1 fig.* 1922.—This paper reports the result of testing the author's age index, proposed in 1920, by computing the indices of a number of communities with 2 different age groupings, one having 6 age groups the other only 3. The communities used were the 99 counties of Iowa in 1915. The correlation coefficient was found to be $+ 0.84 \pm 0.02$, indicating that the index may be used with considerable confidence, even where the original statistics furnish only 3 broad age classes for the entire life span.—*Sylvia L. Parker.*

4009. Renner, O. **Das Rotnervenmerkmal der Önotheren.** [Red veins in Oenotheras.] Ber. Deutsch. Bot. Ges. **39**: 264–270. 1921.—This paper deals with a discussion of Heribert-Nilsson's view on this subject. The author thinks that the homozygous dominant combination of factors for red veins is zygotic lethal. This opinion is supported by the fact that a large number of aborted seed was observed in the crosses where such a genetic combination was expected. The author suggests that the excess of plants with red veins over the expectancy is due to the faster tube growth of those pollen grains which carry the dominant factor for red veins.—*M. Demerec.*

4010. Renner, Otto, und Walter Kupper. **Artkreuzungen in der Gattung Epilobium.** [Species hybridization in the genus Epilobium.] Ber. Deutsch. Bot. Ges. **39**: 201–206. 1921.—The results in this preliminary report differ from the conclusions reached by Lehmann. Experiments showed that the reciprocal crosses between species of *Epilobium* are different. Lehmann explains this difference on the assumption that the diploid chromosome set in the parental species consisted of 2 different haploid sets. He parallels the appearance of different reciprocal crosses in *Epilobium* with the similar appearance in the crosses between heterogamous Oenotheras. The authors think that the difference in reciprocal crosses is due to the influence of the cytoplasm which is brought into the cross by one parent only.—*M. Demerec.*

4011. Reuter, M. **Zur Frage des Hermaphroditismus beim Wilde.** [The question of hermaphroditism in game.] Zeitschr. Forst.- u. Jagdw. **54**: 107–110. 1922.—An hermaphroditic deer is described and the common appearance of hermaphroditism among female hyenas is discussed.—*J. Roeser.*

4012. Schlumberger, Otto. **Pflanzenschutz und Kartoffelzüchtung.** [Plant disease control and potato breeding.] Fühlings Landw. Zeitg. **71**: 183–191. 1922.—The importance of potato breeding as a means of plant disease control is pointed out. Promising results

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obtained by this method in England and the U. S. A. are mentioned. As the breeding for disease resistance is considered the only means of finally solving the problem, Germany is urged to do much more work along this line.—*P. Kvakan.*

4013. Seashore, Carl E. **Individual and racial inheritance of musical traits.** 2nd Internat. Congress Eugenics. Vol. I. Eugenics, genetics, and the family. *p. 231–238.* Williams & Wilkins Co.: Baltimore, 1923. The gift of music may be enhanced in children from generation to generation by scientific forethought in mating. To this end, the concept of musical talent must be clarified, recognizing that it is not one but a group of hierarchies of talent, each more or less independent of the others; the tonal talents, for example, are as independent of the rhythmic talents as the color of the eyes is independent of stature. Knowledge of the laws of the inheritance of musical talent must be based upon accurate scientific measurements and statistics on the same biological principles as are employed in the study of inheritance in plants and animals. Such factors as the sense of pitch, the sense of rhythm, musical imagination, musical memory, musical intellect, creative imagination, quality of voice, range of voice, and volume of voice, may be isolated and measured or rated in a given individual and the findings may be compared for successive generations. Such of these factors as should be found to be heritable may then be predicted as stature is now predicted with various degrees of certainity on the basis of family history of stature. Such knowledge will be used in the future not primarily in formal eugenic guidance, which is quite within the range of possibility, but rather through the situation that scientific facts of this kind will become a part of the store of common knowledge and will enrich and improve common sense knowledge and natural reactions in courtship and mating. As the rare rose is more beautiful to the botanist and the floriculturist than to the ignorant peasant, so organized knowledge of the laws of musical inheritance will give direction and warmth to nature's spell of love in mating a rare talent with a rare talent.—*Carl E. Seashore.*

4014. Sinnott, E. W., and George B. Durham. **Inheritance in the summer squash.** Jour. Heredity 13: 177–186. *2 fig.* 1922.—Self-fertile strains in *Cucurbita Pepo* were discovered and a number of pure lines established. Inheritance of various plant characters were studied. White body color in fruit is dominant over yellow and yellow over green. Plain (solid or self) color of fruit is dominant over striping in some cases but appears to be recessive in others. Wartiness of fruit is dominant over smoothness and may be caused by at least 2 independent factors, cumulative in their effect. "Disc" fruit shape is dominant over "sphere," the main difference being due to a single factor although 1 or more additional factors may produce minor effects. White flesh is usually dominant over cream and single blossom-end scar over double, although the latter character is readily modified in its expression by the environment. Many other characters were found to be definitely inherited, but the manner of their inheritance is not as yet clearly established.—*E. W. Sinnott.*

4015. Springer, Mary G. **The effect upon developing eggs of extracts of embryos of the same species.** Biol. Bull. 43: 75–96. 1922.—Cultures of sea-urchin and starfish were treated with "egg extract," i.e., suspensions of crushed eggs in sea water, distilled water, acidified water, ether and water, acetone and water, or alcohol and water. In general, experiments upon Asterias eggs by extracts of the same species in sea water solution showed a slight retardation, a higher degree of cytolysis, and a greater tendency to stop either at the blastula or gastrula stage. Extracts of Arbacia larvae, when present in sufficient concentration with any of the solvents mentioned, definitely retarded the development of eggs of the same species, causing cytolysis, arrests of growth, and a very noticeable failure of eggs to develop beyond the early, non-motile blastula stage. If formative substances do exist in the early embryological stages, they are unable, under the conditions tried, to be effective.—*Caroline M. Perkins.*

4016. Staffe, Adolf. **Untersuchungen über die Augen- und Haarfarbe der Schulkinder des Kuhländchens. [Investigations on the eye and hair color of the school children of Kuhländchen.]** Arch. Rass.- u. Ges. Biol. 14: 305–314. 1922.—Blue eyes and blonde hair are Nordic characteristics the inheritance of which has been extensively studied; their frequency afford a good index of the amount of Nordic blood in a population. In this study of 3,058 boys and 3,014 girls, 6–14 years of age, the frequency of blue eyes was found to be 46 per cent and of blonde hair 59 per cent as compared with 47 and 75 per cent, respectively, for Swedish recruits. This tends to confirm the ethnological evidence that the people of Kuhländchen, the region of Mendel's nativity, are of prevailingly Nordic origin. It must be borne in mind however that children tend to become darker with age, a phenomenon which the author attributes to heterozygosis with early incomplete dominance. In this material blue eyes and light hair were not closely associated. The frequency of blue eyes among girls was found to be slightly greater than among boys. The author believes with Lanz that the supposed dominant sex-linked 2nd factor for eye pigmentation is peculiar to Mongolian strains and their hybrid descendants. Red hair (1.38 per cent) was found to be twice as common among boys as among girls, suggesting a sex-linked epistatic factor. Freckling is strongly associated with light and especially red hair. The same is possibly true of birthmarks and naevi.—*C. H. Danforth.*

4017. Sverdrup, Aslaug. **Postaxial polydactylism in six generations of a Norwegian family.** Jour. Genetics 12: 217–240. *6 pl., 1 fig.* 1922.—Two types of postaxial polydactylism are recognized. Type A, the more pronounced form, is characterized by the strong and equal development of the 5th and 6th digits, generally associated with a more or less defective additional metacarpal or metatarsal. The trait may manifest itself in any or all extremities, but the right hand shows a more variable tendency than the left. Type B is characterized by small supernumerary fingers without bony connection with the rest of the hand. The feet of individuals with type B hands may show as extreme a development of polydactylism as those belonging to type A. Polydactylism of both types is transmitted regularly by affected parents to part of their offspring. However, in one line the number of affected individuals is in excess of 50 per cent (17: 8) and here most of the cases are of type A, while in another line the number of polydactylous individuals is less than would be expected (8: 14) and all are type B. Similar observations have been reported by others, from which the author is led to suggest that type A is the product of cumulative factors while type B is due to only 1 factor. It seems probable that the latter may sometimes be suppressed by an inhibiting factor. Associated with type A is a clearly demonstrable shortening of the 5th metacarpal bone but it has not been determined whether this is a secondary manifestation or is due to a separate gene linked with one of those for polydactylism.—*C. H. Danforth.*

4018. Swingle, W. W. **Is there a transformation of sex in frogs?** Amer. Nat. 56: 193–210. 1922.—The author replies to E. Witschi [Amer. Nat. 55: 641.] who is said to be convinced that the problem of sex development and differentiation in frogs has been settled. The author feels that the time has come for a revision of the entire question of sex development in Anurans. Evidence is adducted to show that Bidder's organ is homologous to the pro-testis of frogs, and is not a rudimentary ovary, except in females. He does not agree with Witschi on parallelism in behavior of Müllerian ducts and the gonads. Hermaphroditism in frogs is considered.—*R. K. Nabours.*

4019. Swingle, W. W. **Spontaneous metamorphosis of the American axolotl.** Amer. Nat. 56: 560–567. 1922.—Autoplastic and homoplastic thyroid transplantation appeared to have no effect on the metamorphoses of the American axolotl; whereas heteroplastic, using the glandular tissue of *Necturus*, and thyroid feeding, using desiccated thyroid tissue with 0.21 per cent iodine, both had perceptible influence in hastening metamorphosis. Heteroplastic pituitary transplantation gave indefinite results. Thyroidectomy performed before the onset of metamorphosis effectively prevented the latter, while thyroidectomy after the onset of metamorphosis had no effect. These animals were not entirely satisfactory material. There is discussion of other matters concerning axolotls, and the influence of their thyroids on metamorphoses in other Amphibia.—*R. K. Nabours.*

4020. Tjebbes, K., en H. N. Kooiman. **Erfelijkheidsonderzoekingen bij boonen. VII. Bloemkleur en zaadhuidkleur. [Genetic investigations on beans. Flower color and seed coat color.] VIII. Over de erfelijkheid van de eigenschap dorschbaarheid van de pene. [Concerning the inheritance of threshability of the pod.]** Genetica 4: 447–456. 1922.—From various crosses with beans the authors are led to conclude that: (1) there is an intensifying factor for color, *F*, which when acting with 1 or more of the factor complexes *AB*, *AC*, or *AD* produces lilac flower color; (2) there is a different factor, which, although it has no definitely clear influence on the colors of the seed coat, can nevertheless cause the flowers to be colored, as is shown by the brown beans with colored and white flowers; (3) in connection with the reports of Shaw and Morton it must be assumed that the factor *F* may be disturbed in its action by the factor producing the "eyed" condition. Crosses between threshable and non-threshable varieties of beans reveal 1 main factor difference, the threshable condition being dominant. The results in F_2 do not constitute a very close fit (174: 38) but the F_3 generation gives a ratio more nearly in accordance with expectation (1572: 572).—*A. R Saunders.*

4021. Vogt, A., und R. Klainguti. **Weitere Untersuchungen über die Entstehung der Rotgrünblindheit beim Weibe. [Further investigations on the origin of red-green blindness in women.]** Arch. Rass.- u. Ges. Biol. 14: 129–140. 1922.—An examination of 2238 Basel school girls 11–16 years old revealed 8 cases of colorblindness. This is about the frequency of colorblindness among women of Central Europe generally (0.4 per cent). The affected subjects and as many of their relatives as could be reached were subjected to careful study to test the theory that colorblindness is a typical sex-linked trait. The evidence is all in accord with this hypothesis. It is noteworthy that 2 colorblind parents produced only colorblind children, 1 son and 2 daughters; and that the marriage of a colorblind man with a (presumably) heterozygous woman resulted in all 4 of the possible types of offspring. The authors are inclined to doubt the genetic separateness of the different forms of colorblindness, although this question is left open.—*C. H. Danforth.*

4022. Wellensiek, S. J. **De erfelijkheid van het al of niet bezit van "draad" bij rassen van Phaseolus vulgaris L. [Heredity of stringiness of Phaseolus vulgaris varieties.]** Genetica 4: 443–446. 1922.—The writer crossed 3 pure lines of stringless beans with a variety, "Wagenaar," having a high degree of stringiness. In the F_1 generation the stringless condition was dominant, with monohybrid segregation in F_2. The actual ratios agree well with the expected results and apparently there exists a monofactorial difference between the variety "Wagenaar" and the stringless pure lines.—*A. R. Saunders.*

4023. Winge, Ö. **A peculiar mode of inheritance and its cytological explanation.** Jour. Genetics 12: 137–144. *1 pl., 8 fig.* 1922.—Inheritance of black-spotted versus non-spotted dorsal fin in the fish *Lebistes reticulatus* had been found by J. Schmidt [see Bot. Absts. 10, Entry 1748] to follow the distribution which a Y chromosome would have. In cytological examination Winge finds 23 pairs of chromosomes, all 46 very much alike, at maturation in the male; 46 were also counted in female somatic cells and indicated in oogenesis. Though no sex chromosomes were identified, he assumes the male to have had XY, the female XX, as required by the genetic results. He proposes the term "one-sided masculine inheritance" for Schmidt's case, and states that sex-linked inheritance of the Drosophila type has also been found in *Lebistes.*—*H. J. Muller.*

4024. Winge, Ö. **The interaction between two closely linked lethals in Drosophila as the cause of the apparent constancy of the mutant "spread."** Genetica 4: 321–338. 1922.—A stock of *Drosophila melanogaster* characterized by holding the wings outstretched was found to differ from the wild type in 2 factors: (1) a gene responsible for the morphological peculiarity, acting as a 3rd chromosome dominant with a recessive lethal effect; (2) a lethal in the opposite chromosome, crossing over with the 1st gene in about 1 per cent of cases and thus causing the stock to breed almost true. The author supposed that the stock was identical with spread

and concluded that the published accounts of spread as a recessive are incorrect; but in a note added to the reprints he explains that the stock he worked with is not spread but dichaete and agrees with dichaete in its behavior [see Bot. Absts. 12, Entry 4001.]—*Alexander Weinstein.*

4025. Wolfe, A. B. **Eugenics and social attitudes.** 2nd Internat. Congress Eugenics. Vol. II. Eugenics in race and state. *p. 413–418.* Williams & Wilkins Co.: Baltimore, 1923.—The unmanageableness of society results from a maladjustment between the need of rational cooperative control and the conflict instincts inherited from the biological past, and the hold-over of political and economic individualism from the 18th century. The deficiency is one of proper attitudes more than of intellectual capacity. The task of eugenics is therefore not only selections for capacity but the development in the population at large, through every available means, of attitudes suitable to social requirements. Unless this is done selective eugenics stands little chance of adoption by democratic societies. Such a broadening of aim is in accord with Galton's definition of eugenics. The most dangerous dysgenic element is not necessarily in the "lower" classes, but, as concerns attitudes, may be found in the middle classes. The most pressing tasks are: (1) to develop all the intellectual capacity; (2) to free knowledge from censorship of any kind; (3) to acquire in the general population a scientific attitude; (4) to develop mutual tolerance and understanding; (5) to acquire a morality of self-respect; (6) to substitute workmanship for acquisitiveness, and cooperation for conflict. Human attitudes and their modification should be the prime interest of all the eugenists except technically trained genetists.—*A. B. Wolfe.*

4026. Young, C. C. **Practical tests in Karakul breeding.** Jour. Heredity **13**: 229–236. 1922.—It has been found that the sheep thrive in a variety of climates but seem to do best under desert conditions. By properly selecting long-wool ewes it has been found possible to obtain high grade Karakul pelts by crossing with the imported rams, as the black, tightly curled wool of the Karakul seems to be entirely dominant. It is emphasized that the Karakul is a mixed breed, as the natives of the Kara-Kum region have no conception of scientific breeding and cross their fur sheep with all other native strains.—*R. C. Cook.*

4027. Zeleny, Charles. **The temperature coefficient of a heterozygote with an expression for the value of a germinal difference in terms of an environmental one.** Biol. Bull. **44**: 105–112. *3 fig.* 1923.—The heterozygote between normal full eye and ultra-bar eye in *Drosophila* shows an increased number of ommatidia as the temperature at which the larvae are reared decreases, at a rate similar to that characteristic of ultra-bar and not of full eye. Although a single ultra-bar factor is not sufficient to bring about a complete effect in reducing ommatidia number as produced by 2 ultra-bar factors, it is sufficient to produce the complete change to a physiological system of the ultra-bar type. The gene ultra-bar has the same type of reaction as a temperature difference. On the logarithmic scale of ommatidia number it is possible to express the relation between the germinal factor and the environmental factor as a constant.—*D. F. Jones.*

HORTICULTURE

J. H. Gourley, *Editor*

(See also in this issue Entries 3662, 3729, 3738, 3761, 3771, 3796, 3815, 3872, 3898, 3951, 3966, 3967, 4134, 4355, 4400, 4448, 4467, 4477, 4578, 4586, 4590)

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4028. Anonymous. **Pollination in orchards.** New Zealand Jour. Agric. **25**: 148–150. 1 *chart.* 1922.—Some recent investigations are reviewed.—*N. J. Giddings.*

4029. Anonymous. **Tree surgery as applied to citrus.** Florida Grower **27**[8]: 6. *6 fig.* 1923.—Tree surgery proved successful. The treatment of wounds and application of materials were essentially the same as with other kinds of trees.—*J. C. Th. Uphof.*

4030. Anonymous. **Varieties of fruit recommended for planting in British Columbia.** British Columbia Dept. Agric. Circ. New Hort. Ser. 64. *4 p.* 1922.

4031. Anonymous. **Verslag over het jaar 1920 van het Department van den Landbouw in Suriname.** [Report for the year 1920, Department of Agriculture, Surinam.] *129 p.* Paramaribo, 1920.—Short reports are given of the culture, harvest, and condition of the following: coffee, cocoa, coconuts, cotton, rice, malachra. The management of government forests is also reported.—*J. C. Th. Uphof.*

4032. Allen, W. J. **Some experiments in the storage of lemons.** Agric. Gaz. New South Wales 34: 127. 1923.—Treatment of lemons with slaked lime dust to prevent decay showed slight advantage over no treatment and more marked advantage than dusting with sulphur or coating with vaseline.—*L. R. Waldron.*

4033. Anthony, R. D., and J. H. Waring. **Methods of interpreting yield records in apple fertilization experiments.** Pennsylvania Agric. Exp. Sta. Bull. 173. *42 p.* 1922.—The author discusses methods used in conducting and reporting orchard field trials based on data taken from 5 orchards in Pennsylvania beginning in 1907 and 1908. The general plan of each test is described, with notes on types of soil and special conditions present in each orchard. The yield records on the various plots are interpreted through the comparative use of Bessel's and "Student's" formulae for determining the probable error. Attention is called to the necessity of reducing the common factors of variability such as topography, soil, and unknown stocks as well as the need of increasing the number of trees under treatment. Certain results for the orchardist are derived; "apple trees standing in a non-legume sod must receive nitrogenous fertilizers. Commercial carriers of nitrogen have proved as valuable as manure. Trees under cultivation have not shown a profitable return from the addition of fertilizers when a good cover crop was grown. Where a cover crop was not grown in the cultivated plots the trees did not maintain their vigor."—*C. R. Orton.*

4034. Arens, P. **Het planten met marcotten.** [Planting with "marcotts."] Arch. Rubber cult. 5: 382–387. 1921.—An account is given of a number of plantings with "marcotts." Most of these were successful, and the trees could be tapped sooner than when stumps were planted. This method is not considered objectionable if good roots are developed before planting.—*C. D. La Rue.*

4035. Barss, A. F. **Small fruit survey.** British Columbia Dept. Agric. Circ. 39. *15 p.* 1922.—A report is made on the cost of growing strawberries and red raspberries in certain coast sections of British Columbia during 1921.—*J. W. Eastham.*

4036. Beckwith, Charles S. **Report of the cranberry substation.** Proc. Amer. Cranberry Growers Ann. Meeting 53: [Unpaged.] 1923.—On savannah land where vine growth was not excessive a complete fertilizer gave in 4 successive years an increase of 20, 68, 73, and 107 per cent, respectively, over the unfertilized plot, which yielded 35 barrels per acre, which is twice the average for New Jersey. Recent tests show that nitrate of soda is more efficient than dried blood. On muck soils no fertilizer is known that can be safely used year after year. —Treatments of from 1,000 to 12,000 pounds of lime per acre have not yet given results.— Three spray applications were effective in keeping the berries sound until Aug. 1, by which time those on unsprayed plots had rotted; by Aug. 25 all had rotted. Summer flooding destroys part, if not all, of the cranberry girdlers but may cause rot.—Data are being collected relative to frost prediction.—*J. K. Shaw.*

4037. Bevan, W. **The Sultana vine in Cyprus.** Cyprus Agric. Jour. 18: 9–10. 1923.— In 1913, cuttings of this seedless grape were imported from Crete and distributed to vine growers. While good yields have been secured they do not equal those obtained in Crete. It is thought that more intelligent pruning may increase the yield.—*W. Stuart.*

4038. Bobilioff, W., en C. A. Gehlsen. **Over het uitdunnen volgens bastonderzoek op de gouvernements rubberonderneming "Vada."** [The use of bark investigation as a guide in thinning on the government estate "Vada."] Arch. Rubbercult. 5: 406–412. 1921.—The study of the bark is compared with production as a means of thinning on the government estate "Vada." Eight hectares were thinned, 4 by each method. In 3 cases out of 4 the bark investigations gave better results than yield data.—*C. D. LaRue.*

4039. Chevalier, A. **L'olivier Arbéquina.** [The Arbequina olive.] Rev. Bot. Appl. 2: 26–27. 1922.—This olive variety is cultivated in the province of Lerida, Spain, where it represents 92 per cent of all varieties planted. It is more resistant to cold than any of the other varieties there grown and is reported to be a heavy bearer. Every 2 years, in some cases more often, the trees are severely pruned to expedite gathering the fruits.—*Paul Russell.*

4040. Crawford, R. P. **World crops for America.** Sci. Amer. 126: 226–227. *5 fig.* 1922. A brief popular description is given of the ways in which plants are sought abroad and brought to American experiment stations for testing.—*Chas. H. Otis.*

4041. Davis, Kary C. **Horticulture. A text book for high school and normals.** *vi + 416 p., 287 fig.* J. B. Lippincott Co.: Philadelphia, 1922.—This volume is designed to give to students a course in gardening, orcharding and small fruits that will cover the horticultural field, omitting unessentials. Six chapters are devoted to preliminary studies and plant propagation; 6 to vegetable gardening; 6 to various phases of orcharding; 4 to small fruits, nuts, etc.; 1 to the home wood lot and forestry; and 1 each to soil improvement, the home and school grounds, weeds, and birds; also an appendix with data of value to the student and grower.—*J. H. Gourley.*

4042. Donkersloot, F. W. **De vegetatieve vermenigvuldiging van Hevea als kebonpraktijk.** [Vegetative reproduction of Hevea as an estate practice.] Arch. Rubbercult. 5: 510–540. 1921.—This is a full account of the methods of vegetative reproduction of *Hevea brasiliensis* developed on the estates of the Holland-American Plantation Co. under the direction of the botanist. Cost accounts, etc., are given.—*C. D. La Rue.*

4043. Esbjerg, Niels. **Forsög med Sorter af Stikkelsbaer 1910–1920.** [Experiments with gooseberries, 1910–1920.] Tidsskr. Planteavl. 28: 596–614. 1922.—This report on the work of the state agricultural experiment station on methods of raising gooseberries for the market includes a discussion of diseases and other factors. The gooseberry is relatively a much more important crop in Denmark than it is in America.—*Albert A. Hansen.*

4044. Fletcher, F. J. **Market nursery work: A series of six books on the cultivation of crops for market. Vol. VI. Decorative plants, trees and shrubs.** *vi + 68 p., 23 fig.* Benn Bros.: London, 1922.—This reference book is designed to assist nurserymen.—*J. H. Gourley.*

4045. Galloway, B. T. **An historic orange tree.** Jour. Heredity 13: 163–166. *2 fig.* 1922.—The introduction of the original Washington naval orange tree from Bahia, Brazil, is recounted. Twelve trees were sent to William Saunders, Plant Propagator in the U. S. Department of Agriculture. From these he budded other trees which he sent to Miss Elizabeth Tibbetts, Riverside, California. Of these original budded trees 1 is still living at Riverside and 1 in the citrus greenhouse at Washington. From these trees has developed the entire navel orange industry of California.—*Robert C. Cook.*

4046. Galloway, B. T. **Improved method of propagating the Litchi.** Jour. Heredity 13: 201–206. *5 fig.* 1922.—The Litchi is one of the principal fruits of South China, but is practically unknown in the Western Hemisphere. This is in part due to the fact that the seed perish if not planted immediately and to the great difficulties of propagation. Inarching is the method used by the Chinese, but it is slow and produces misshapen plants. The Office

of Foreign Seed and Plant Introduction, U. S. Department of Agriculture, has developed a steam-heated propagating case in which the cuttings are placed. This insures uniform temperature, light, and humidity, and with proper soil (¾ peat and ¼ sand) very satisfactory results are reported.—*R. C. Cook.*

4047. Gandrup, Johannes. **Over den invloed van teer op Heveaschors.** [The influence of tar on Hevea bark.] Arch. Rubbercult. 5: 549–559. 1921.—Tar has no effect on the renewal of bark which has been scraped away, as in the treatment of disease. Where the scraping extends nearly to the cambium the tar kills it and increases the size of the wound.—*Carl D. LaRue.*

4048. Gehlsen, C. A. **De waarde van het bastonderzoek voor de plantsoensveredeling.** [The value of bark examination in thinning.] Arch. Rubbercult. 5: 453–463. 1921.—The author finds no difference in reliability between bark examination and yield as criteria for thinning rubber plantations; and as bark examination is cheaper it is preferable.—*C. D. LaRue.*

4049. Grantham, J. **Over het Uitdunnen volgens bastonderzoek op de gouvernement's rubberonderneming "Vada."** [Thinning by means of bark examinaton on the government rubber estate "Vada."] Arch. Rubbercult. 5: 541–542. 1921.—The author criticizes Bobilioff and Gehlsen [see Bot. Absts. 12, Entry 4038], claiming that their data are not sufficiently reliable to permit of definite conclusions.—*C. D. LaRue.*

4050. Hendrickson, A. H. **Further experiments in plum pollination.** Califonia Agric. Exp. Sta. Bull. 352. 247–266 1922.—Results are reported from 3 years' work in 2 California counties on additional varieties, many of which have recently become prominent. The value of honey bees in orchards of shipping plums is emphasized. In addition to varieties previously reported the following Japanese plums proved self-sterile: Apex, Duarte, El Dorado, Formosa, Gaviota, Prize, and Upright. In 3 years' experiments, Formosa and Gaviota were shown to be inter-sterile. Beauty, Methley, and Santa Rosa seemed to be self-fertile, at least to a limited degree. Apex, El Dorado, Formosa, Gaviota, and Kelsey were generally scanty pollen producers and therefore of questionable value as pollinators of other Japanese varieties. Beauty, Burbank, Duarte, Santa Rosa, and Wickson seemed to be the most effective pollinators for the Japanese varieties. Among the European varieties, Imperial and Tragedy were again shown to be self-sterile. Likewise President, Quackenboss, Standard, and Washington failed to set fruit with their own pollen. Diamond set well with its own pollen 1 year, but failed to do so the other 2; for practical purposes it must be considered self-sterile. Pond (Hungarian or Gros prune) when pollinated with its own pollen set no fruit in 1920, but set a light crop in 1922; it is probably partially self-fertile. California Blue, Giant, and Yellow Egg proved self-fertile. Grand Duke, contrary to results obtained at Davis, California, where it was found to be self-sterile under certain conditions, set a small percentage of fruit with its own pollen. All European plums blossoming in midseason or later appeared to be able to cross-pollinate effectively. Tragedy was able to pollinate the Japanese varieties but was not pollinated by them. The presence of honey bees materially aided in setting heavy crops on the following combinations of varieties: Formosa and Wickson; Beauty and Santa Rosa; Diamond and Grand Duke. Observations showed that many other combinations were benefitted by bees. Inter-pollination of Formosa and Gaviota by bees failed; interplanting of these varieties for cross-pollination purposes cannot be recommended. The results showed that whenever a particular cross had been made for 2 or 3 successive years the percentage of set was usually lowest in 1922, a fact probably due to the prolonged period of cold rainy weather during the blossoming season of that year.—*A. R. C. Haas.*

4051. Hillenmeyer, H. F. **Synoptic history of the American grape.** Nation. Nurseryman 31[4]: 97–99. 1923.—An historic statement is given of grape culture in American and particularly in Kentucky, together with critical observations.—*J. H. Gourley.*

4052. La Rue, Carl D. **Structure and yield in Hevea brasiliensis.** Arch. Rubbercult. 5: 574–588. 1921.—The correlation between the number of rows of latex-vessels in the outer bark and those in the inner bark is 0.094 ± 0.059 in the case of 126 seedlings $2\frac{1}{2}$ years old, while for mature trees it is no higher. It therefore appears that trees do not produce latex-vessel rings at a uniform rate and that the number of vessels in a seedling cannot be taken as a criterion of the number the mature tree will possess. The correlation between yield of dry rubber and number of rings of latex vessels is 0.513 ± 0.016, between yield of dry rubber per year per cm. of width of tapping surface and number of latex-vessel rings, 0.0457 ± 0.017. The bark types as based on distribution of stone-cell layers described by Bobilioff (Arch. Rubbercult. 2: 1918) could not be distinguished in this investigation. The structure of the bark of a given tree may change under certain conditions. The following correlations are given: between yield of rubber and circumference of tree, 0.299 ± 0.019; circumference of tree and thickness of bark, 0.26 ± 0.02; number of latex-vessel rings and circumference of tree, 0.162 ± 0.021; thickness of bark and number of rings of latex-vessels, 0.15 ± 0.02; increase in girth and yield of rubber, 0.375 ± 0.038. These indicate the importance of rapid growth of the trees during the whole period of production. Approximately 1000 trees were used in computing the correlations.—*C. D. LaRue.*

4053. Lesourd, F. **Rajeunissement des pêchers en plein vent. [Rejuvenation of peach trees out of doors.]** Rev. Hort. 91: 432. 1921.

4054. Maas, J. G. J. A. **Uitdunnen volgens bastonderzoek. [Thinning by bark examination.]** Arch. Rubbercult. 5: 543–548. 1921.—The author criticizes Bobilioff and Gehlsen [see Bot. Absts. 12, Entry 4038], showing the unreliability of their data.—*C. D. LaRue.*

4055. McCormick, A. C. **Blight resistance in pear stocks.** Nation. Nurseryman 31[4]: 112, 114. 1923.

4056. Mason, S. C. **The Saidy date of Egypt: a variety of the first rank adapted to commercial culture in the United States.** U. S. Dept. Agric. Bull. 1125. *35 p., 8 pl., 4 fig.* 1923. —Of hundreds of varieties of the date palm few have attained commercial importance in Europe or America and the discovery of the adaptation to southern California of the Egyptian Saidy (Sayd or Saydeh) variety "marks a new era in date production in the United States." Much space is devoted to such topics as: character and early history of the Libyan oases (the home of the Saidy date), early Egyptian knowledge of the date palm, accounts of oasis dates by modern teachers, the proof of the identity of "Wahi," "Sewi," and Saidy dates, and its standing as a commercial variety. A study of the temperature requirements for the Saidy date shows that conditions at Mecca, California, are very nearly identical with those of the Egyptian oases. At Temple, Arizona, there is a deficiency in the mean minimum temperature curve of 7–8°F. between flowering time and midsummer, a condition which may account for the fact that these dates fail to mature at the Temple gardens. Saidy dates also have greater resistance to atmospheric humidity than such varieties as Deglet Noor, rendering them more immune to the smut fungus *Graphiola phoenicia*, and suitable for culture to a vast area of the Imperial Valley of California and the lower Colorado Valley of both California and Arizona.—*J. T. Buchholz.*

4057. Middleton, W. A. **Yields, grades, prices and returns for apple varieties in the Okanagan Valley.** British Columbia Dept. Agric. Bull. 90. *13 p.* 1922. —A comparison is made of 25 commercial varieties.—*J. W. Eastham.*

4058. Peck, H. H. **An object lesson to citrus growers.** Agric. Gaz. New South Wales 34: 70. 1923.

4059. Price, J. C. C. **The grape.** Alabama Agric. Exp. Sta. Bull. 211. *33–50. 14 fig.* 1920.—This is a report of tests of 48 varieties of bunch grapes and 6 of muscadine grapes.

Technical descriptions of the several varieties of fruit and photographs of typical clusters are furnished. Judged by the productiveness, hardness, and vigor over a period of 6 years under similar conditions and treatment on the Experiment Station Farm at Auburn, Alabama, the following bunch grapes are considered best suited to Alabama conditions: Brighton, Catawba, Concord, Delaware, Diamond, Ives, Isabella, Moore, Niagara, Warden, and Winchell. The results with muscadines are not as clear cut, though Scuppernong and Thomas grapes seem to be the best of those tested.—*W. A. Gardner.*

4060. Proschowsky, A. R. **Butia capitata (Becc.) var. deliciosa.** Rev. Hort. 94: 39. 1922.—The fruits are entirely without fiber, easily freed from the stone, and of agreeable, subacid flavor. The tree withstands drought and relatively low temperatures without injury.—*E. J. Kraus.*

4061. Robertson, W. H. **The growth of the small-fruit industry [in British Columbia.]** Agric. Jour. [British Columbia] 7: 270–271. 1923.

4062. Schuster, C. E. **Filberts.** Oregon Agric. Exp. Sta. Circ. 28. [Unpaged.] 1922.—The author discusses suitable soils, propagation, planting, cultivation, pruning, harvesting, varieties, and cross-pollination.—*C. E. Owens.*

4063. Schuster, C. E. **Pollination of the sweet cherry.** Oregon Agric. Exp. Sta. Circ. 27. [*Unpaged.*] 1922.—Self-sterility, inter-sterility, pollinizers and cross-pollination, number of pollinizer trees, varieties suitable for pollinizers, and part played by bees are discussed.—*C. E. Owens.*

4064. Schuster, Wilh. **Das liebliche Blümchen Borretch. [The lovely borage blossoms.]** Die Biene 61: 23. 1923.—Borage (*Borago officinalis*) was formerly used extensively in salads as well as recognized as a desirable honey plant.—*M. G. Dadant.*

4065. Simpson, R. **Government nurseries at Oliver, B. C.** Agric. Jour. [British Columbia] 7: 222–223. 1922.

4066. Stahel, Gerold. **Eukele practische wenken voor het oculeeren van cacao. [Some practical hints in budding cacao.]** Dept. Landb. Suriname Mededeel. 17. *2 p.* 1919.—Seed for stocks must be selected from very strong trees. The seedlings with 2–3 leaves are transplanted in well shaded nursery rows; when 1½–2 years old they are usually 2½–3 feet high and suitable for budding, which is done by the Forkert method preferably in the first weeks of the rainy season. Within 2–3 weeks the top of the plant is bent over and tied to a neighboring one so that the budded part is at the upper surface. When the bud has produced a shoot 1½ feet long (4–6 months) the bended portion of the stem is cut off directly above the budding place. Budding wood may be used only when the bark has a dark brown color.—*J. C. Th. Uphof.*

4067. Steinmann, A. **Over den invloed van teer op de regeneratie van den bast bij Hevea brasiliensis. [The influence of tar on the renewing bark of Hevea brasiliensis.]** Arch. Rubbercult. 5: 495–503. 1921.—An increased thickness of bark may be secured by the use of coal tar, due to increased activity of the cork cambium. Since no increase takes place in the latex-bearing part of the bark the application of tar is not advised.—*C. D. LaRue.*

4068. Stevens, Neil E. **The possible relation of spring temperatures to the keeping quality of the cranberry crop.** Proc. Amer. Cranberry Grower's Ann. Meeting 53: [Unpaged.] 1923.—Supranormal temperatures during the shipping season and excessive precipitation during the harvest period are unfavorable for good keeping qualities of cranberries. It is shown that accumulated excess temperatures during May and June are usually correlated with poor keeping quality of the crop for that season. Data for the years 1912–1922 show only 1 year in which this general relationship does not hold; it is thought that this season was too

cool for favorable development of the cranberry crop. It is thought that a knowledge of the temperatures for May and June will be of value to sales agents in handling the crop for the season.—*J. K. Shaw.*

4069. Stokley, C. L. **Succeeding with the Cavendish banana.** Florida Grower 27^{10}: 8–9. 1923.—Conditions in parts of Florida are suitable for commercial banana growing. Pure muck soils on which water does not stand are best although higher land answers if well supplied with humus and irrigated. Fertilizer is necessary for high yields. Plants set out in March or April produce fruit the following autumn, 1 acre yielding as much as 400 bunches.—*J. C. Th. Uphof.*

4070. Stubenrauch, A. V., Milo N. Wood, and Charles J. Booth. **Horticulture for schools.** *xxiii + 325 p., 8 pl., 135 fig.* Macmillan Co.: New York. 1922.—"This book is intended as a text-book of horticulture for high-schools and for other schools requiring a text for pupils of high-school grade, and also for use in homes and reading courses." The major portion of the material in this volume was brought together by the senior author but after his death it was completed by the junior authors.—The material is elementary in nature and the number of subjects treated is extensive for the size of the book.—Five chapters treat of the plant and its propagation; 4 of vegetable culture; 4 of deciduous fruits and orchard management; 1 of semi-tropical fruits; 1 of small fruits and the grape; 2 of marketing; 1 of incidental products; and 1 of the use of ornamental plants.—*J. H. Gourley.*

4071. Tufts, Warren P. **Thinning deciduous fruits.** California Agric. Exp. Sta. Circ. 258. *13 p., 5 fig.* 1923.—Specific recommendations are given.—*A. R. C. Haas.*

4072. Vinken, E. J. **De papaja.** [The papaya.] West Indië 5: 32–35. 1920.—This contains a description of papaya growing. Two instances are cited of a male tree producing fruit. Attempts to change a staminate into a pistilate tree by incisions failed.—*J. C. Th. Uphof.*

4073. Vischer, W. **Over samengestelde kurkhuidvorming en natuurlijke bastvernieuwing bij Hevea brasiliensis.** [Cork formation and bark renewal in Hevea brasiliensis.] Arch. Rubbercult. 5: 486–492. 1921.—Successive layers of cork cambium are formed one inside the other. Since the outer layers die and are shed, bark affected with brown bast disease may ultimately be thrown off. It was found that the application of tar greatly increases the local activity of the cork cambium.—*C. D. La Rue.*

4074. Walle, Paul. **La culture du caféier dans l'état de São-Paulo.** [Culture of coffee in the State of São Paulo.] Rev. Bot. Appl. 2: 5–11. 1922.—The present status of the coffee industry is considered, with brief historical notes, and attention is called to its amazing growth during the past 100 years. The writer then takes up the area occupied by the coffee plantations, method of cultivation, diseases, yield, preparation for the market, principal varieties grown, commercial aspect of the industry, and the future of coffee growing in the state of São Paulo, which he regards as promising.—*Paul Russell.*

4075. White, Elizabeth C. **Report of progress in blueberry culture.** Proc. Amer. Cranberry Growers' Ann. Meeting **53:** [*Unpaged.*] 1923.—A 16-acre plantation more or less in bearing yielded about 1,000 bushels. Nearly all the plants were seedlings and showed much individuality in frost injury. Seedlings on lower ground but from frost-resistant parents showed no damage. Certain named varieties were frost resistant.—*J. K. Shaw.*

4076. Wolk, P. C. van der. **Opkomst en nieuwe wegen der cocos-cultuur.** [Rise and new methods of cocos growing.] West Indië 4: 116–130. 1919.—In transplanting cocos seedlings care should be taken to protect the roots from injury. The vertical method results in germination within 4 months rather than 9, and the seedlings can be planted deeper. Artificial irrigation is desirable.—*J. C. Th. Uphof.*

4077. Wright, Walter Page. **Practical gardening for pleasure and profit.** 6 vol. *367, 365, 367, 359, 370, and 376 p., illus.* Educational Book Co.: London, 1922.—These volumes give a comprehensive treatise of gardening in all its phases. Several other writers have contributed, which has resulted in a cyclopedia of information. The volumes treat respectively of: (1) gardening practice and plant life; (2) vegetables and their cultivation; (3) practical fruit growing; (4) glass houses and pot plants; (5–6) the flower garden.—*J. H. Gourley.*

4078. Wyman, Richard M. **Cultural notes.** Amer. Nurseryman 37[4]: 91. 1923.—This article tells how to handle and transplant nursery stock, especially of evergreens and deciduous shade trees, from the seed bed to the field.—*J. H. Gourley.*

FLORICULTURE AND ORNAMENTAL HORTICULTURE

4079. Anonymous. **Killing weeds on paths and lawns.** New Zealand Jour. Agric. **24:** 304. 1922.

4080. Anonymous. **Sterilization of soil in glass houses.** New Zealand Jour., Agric. **25:** 42–46. *5 fig.* 1922.—Apparatus and methods for rapid and effective steam sterilization are discussed. Such sterilization is of doubtful value for eelworm control as thorough treatment is not likely to extend to a depth greater than 9 inches while eelworms may be found at 18 inches.—*N. J. Giddings.*

4081. Alderwerelt van Rosenburgh, C. R. W. K. van. **Index Pteridophytorum quae anno 1919 in Horto Botanico Bogoriensi coluntur.** [Index of pteridophytes cultivated in 1919 in the Botanic Garden at Buitenzorg.] Bull. Jard. Bot. Buitenzorg III, 1: 338–351. 1919.

4082. Costantin et Magrou. **Applications industrielles d'une grande découverte française.** [Practical applications of a great French discovery.] Ann. Sci. Nat. Bot. 4: i–xxxiii. *Fig. 1–32.* 1922.—A discussion is given of commercial attempts in growing orchids from seed by inoculation with certain endophytic fungi.—*Paul Weatherwax.*

4083. Davidson, H. C. **The culture of pot plants: in rooms, greenhouses, and frames.** *vii + 154 p.* C. Lockwood & Son: London, 1922.—In this practical treatise on the handling of ornamental plants in the house and under glass, chapters are devoted to handling house plants; annuals; herbaceous perennials; hardy and tender shrubs; scented and bulbous plants; and pot plants.—*J. H. Gourley.*

4084. Findeisen, Theodor. **Einiges über Azaleentreiberei.** [About azalea forcing.] Möllers Deutsch. Gärt. Zeitg. **38:** 6–7. 1923.—In forcing *Azalea indica* proper light is of as much importance as heat. Detailed cultural directions are given.—*J. C. Th. Uphof.*

4085. Laplace, F. **Culture des Nymphaea bleus comme plantes annuelles.** [The culture of blue Nymphaeas as annuals.] Rev. Hort. 94: 10–12. *Fig. 3.* 1922.—Plants from seed started in the greenhouse from November to March, when planted in the open near the end of May, flower from July until freezing weather. A number of species and varieties are listed.—*E. J. Kraus.*

4086. Lesourd, F. **Trois variétés de dahlias simples.** [Three varieties of single dahlias.] Rev. Hort. 94: 34. *1 pl. (colored.)* 1922.

4087. Macself, A. J. **Hardy perennials.** *219 p., color photographs, water-color drawings, line drawings.* T. Butterworth, Ltd.: London, 1922.—This is a general treatise on the culture of hardy perennials together with a description of a number of "those that are worth growing." Planting, propagating hardy plants, care of plants in the garden, and plants worth growing are discussed in separate chapters.—*J. H. Gourley.*

4088. Mottet, S. **Eucryphia pinnatifolia Spach.** Rev. Hort. 94: 32–34. *Fig. 8–9.* 1922.

4089. Prescott, Edward E. **The Dahlia in Australia.** *122 p.* Whitcombe & Tombs, Ltd.: Melbourne. 1920.—This volume deals with the evolution of this popular flower, its introduction, a description of types, and with Dahlia species, together with much cultural information.—*J. H. Gourley.*

4090. Purpus, A. **Winterharte Selaginellen.** [Hardy Selaginellas.] Möllers Deutsch. Gärt. Zeitg. **38:** 17–18, 29–30, 41–42. *4 fig.* 1923.—The following species of *Selaginella* are mentioned as resistant to the winters in Germany: *S. helvetica* Lk., *S. denticulata* Link. (not *S. denticulata* Hort.), *S. Douglasi* Spring., *S. mongolica* Rub., *S. Mariesii* Baker, *S. apus* Spring., *S. Ludwiciana* A. Br., *S. nipponica* Franch et Sav., *S. Savatieri* Baker., *S. borealis* Spring., *S. selaginoides* Link., and *S. rupestris* Spring.—*J. C. Th. Uphof.*

4091. Pyle, Robert. **How to grow roses.** *14th ed., 189 p., 15 color pl., half-tones, line drawings.* Conrad & Jones Co.: West Grove, Pennsylvania, 1923.—In this attractive treatise on the culture of the rose, an appeal is made to interest all in rose growing and explicit information is given on choice of varieties and garden operations. The amateur and rose fancier will find the groupings of roses for special purposes a convenient feature of the work. The following chapter headings indicate the mature of the contents: Comradeship of the rose; where on my place can I grow roses: how to choose the choicest; universal favorities and special purpose varieties; laying the foundation; planting; rose-time; protecting the roses; pruning for abundance; the best roses for America; selections by experts for special sections; extending the dominion of the rose; hybridizing; own-root and budded or grafted roses; how to preserve rose fragrance; roses for forcing or indoor bloom. In the appendix are given: Rose-lovers' calendar of operations; rose synonyms; analysis of species; and bibliography.—*J. H. Gourley.*

4092. Roux, J. **Echinopsis Eyriesii et multiplex.** Rev. Hort. **94:** 29–30. 1922.—This is a spontaneous hybrid intermediate between the parents in several characters.—*E. J. Kraus.*

4093. Sanders, Thomas William. **Rock gardens and alpine plants.** *3rd ed., 205 p., illus. (colored pl. and half tones).* W. H. & L. Collingridge: London, 1922.—This is a complete guide to the construction of large and small rockeries, the cultivation of alpine plants, and use of water gardens.—*J. H. Gourley.*

4094. Steidel, Heinr. **Clematis durch Stecklinge vermehrt.** [Clematis propagated from cuttings.] Möllers Deutsch. Gärt. Zeitg. **38:** 42 43. *1 fig.* 1923.—Clematis is usually propagated by grafting but several forms of the *lanuginosa, florida, patens, Jackmanni,* and *coccinae* classes can be propagated successfully from cuttings taken in July. After removing ⅔ of the leaves of the cuttings the latter are put in a mixture of peat dust and sand, covered by a layer of washed sand and placed in a medium warm frame in a shaded and moist environment.—*J. C. Th. Uphof.*

4095. Sturm, H. **Helleborus als winterblühende Blütenstaude.** [Helleborus as flowering herbaceous plants in winter.] Möllers Deutsch. Gärt. Zeitg. **38:** 18–19, 42. 1923.—The following forms are suitable for forcing: *Helleborus abchasicus,* Mme. Tourtado, *H. colchicus, H. corsicus, H. guttatus, H. giganteus, H. Kochi,* and *H. lividis.* Three- to 4-year old plants should be transplanted with soil adhering to the roots and placed under glass in October. Flowers appear within a few weeks.—*J. C. Th. Uphof.*

4096. Toole, William, Sr. **Native plants of Wisconsin suitable for cultivation.** *54 p., frontispiece.* Wisconsin State Horticultural Society: 1922.—This booklet includes an introduction by Frederic Cranefield and 5 separate papers by the author, as follows: Domesticating our native flowers; native shrubs; our native trees; cultivating our native ferns; and our native climbing vines.—*J. H. Gourley.*

4097. Valeton, Th. **Index Zingiberacearum quae anno 1919 in Horto Botanico Bogoriensi coluntur.** [Index of Zingiberaceae cultivated in 1919 in the Botanic Garden at Buitenzorg.] Bull. Jard. Bot. Buitenzorg III, 1: 321–326. 1919.

4098. Webster, Angus Duncan, **London trees.** *xii + 218 p., 32 fig.* Swarthmore Press: London, 1922.—An account is presented of the trees that succeed in London, with descriptive notes and historical incidents. A spirit has grown up in the city to plant and preserve beautiful trees and special provision is made to protect them.—*J. H. Gourley.*

4099. Wust. **Schönblühende Stauden für den Imkergarten, Siedlungen und Vorgarten.** [Beautiful blooming shrubs for the bee garden, settlement, and flower garden.] Markische Bienezeitg. 13: 43. 1923.—Descriptions are given of shrubs of varying heights especially suited to home planting.—*M. G. Dadant.*

VEGETABLE CULTURE

4100. Beckel. **Sortenanbauversuch mit Rotkohl im Jahre 1922.** [Variety test of red cabbage in 1922.] Mitteil. Deutsch. Landw. Ges. 38: 100–101. 1923.—Tests were conducted with 5 varieties on 5 fields. In taste and odor all scored alike but in color Zittauer giant scored highest and Holland blood red lowest. As a result of the trials the author ranks Westfalia first, Danish stonehead second, and Zittauer giant last, with Holland blood red and Othello near the end of the list.—*A. J. Pieters.*

4101. Beckel. **Sortenanbauversuche mit Tomaten im Jahre 1922.** [Variety tests with tomatoes in 1922.] Mitteil. Deutsch. Landw. Ges. 38: 123–124. 1923.—In this test with 4 varieties on 5 experimental fields the variety Danish Export produced the best fruit.—*A. J. Pieters.*

4102. Davidson, H. C. **Vegetable culture: A practical manual.** *viii + 144 p.* C. Lockwood & Son: London, 1922.—This book is an attempt to answer many questions that have come to the author in his correspondence. He outlines his own practices and gives his reasons for them. Special mention is made of trenching and manuring; use of the hoe to destroy weeds and keep the soil in good tilth; use of lime to correct acidity and also for the control of club root of Cruciferae. The volume contains good practical directions throughout.—*J. H. Gourley.*

4103. Holt, P. **Cantaloupes in Imperial Valley.** Amer. Bee Jour. 62:. 379. 1922.

4104. Isbell, C. L., and W. D. Kimbrough. **Use of wooden constructed fire heated hot beds for production of sweet potato plants.** Alabama Agric. Exp. Sta. Bull. 217. *6 p., 2 fig.* 1922.—The authors give directions for construction of trench and broad types of hot beds and recommendations for their operation.—*W. A. Gardner.*

4105. Leijs, J. J. **Zoete pataten.** [Sweet potatoes.] West Indië 4: 136–141. 1919.—A description of sweet potato culture in Surinam is given. The variety Blauwkop (Blue-head), which originated from the White Bermuda is of good quality, but does not yield well. Smitranken is also of good quality and is now being tested for productivity.—*J. C. Th. Uphof.*

4106. Weirup. **Anbauversuche mit Bohnen im Jahre 1922.** [Tests of beans in 1922.] Mitteil. Deutsch. Landw. Ges. 38: 63–66. 1923.—This report covers the performance of 3 varieties of green pole, 2 of wax pole, and 4 of wax bush beans. The pole wax variety Goldkrone yielded heaviest, all pole varieties outyielding the bush varieties.—*A. J. Pieters.*

4107. Weirup. **Anbauversuche mit Erbsen im Jahre 1922.** [Variety tests of peas in 1922.] Mitteil. Deutsch. Landw. Ges. 38: 80–82. 1923.—A detailed report is given of the performance of 4 varieties of garden peas on 5 experimental fields, the variety Moringia receiving the highest score.—*A. J. Pieters.*

4108. Weirup. **Sortenwahl beim Gemüsebau.** [Selecting varieties for vegetable culture. Mitteil. Deutsch. Landw. Ges. 37: 763–764. 1922.—The author gives a list of desirable varieties of peas, beans, carrots, cabbage, and onions.—*A. J. Pieters.*

4109. Zimmerley, H. H. **Cabbage strain tests.** Virginia Truck Exp. Sta. Bull. 37–38. *211–220.* 1922.—Strains of Early Jersey Wakefield in 1920 and 1921 yielded 6.13–9.9 and 6.66–9.87 tons per acre respectively. Early cuttings in 1920 ranged from 0.13 to 4.53 and in 1921 from 0.9 to 5.63 tons per acre. Results show a big variation in total yield and production of early maturing heads from seed obtained from different sources. Strains of Charleston Wakefield in 1920 yielded 7.16–11.9 tons per acre, and in 1921, 10.6–14.22. Early cuttings in 1920 varied from 0.0 to 1.93 tons and in 1921 from 0.4 to 3.50 tons per acre. In 1921 premature seed stalk production in fall-planted Early Jersey Wakefield varied in different strains from 4.7 to 25.3 per cent and in the Charleston Wakefield from 14 to 28 per cent. "In the four earliest lots of Early Jersey Wakefield an average of 10.9 per cent of the plants went to seed as compared with 21.7 per cent in the four latest headings lots. . . . . The plants which form a small compact head early in the season are less likely to seed prematurely than those which are somewhat open headed and leafy."—*H. A. Jones.*

HORTICULTURE PRODUCTS

4110. Anonymous. **Over het gebruik van koffiepulp.** [Concerning the use of coffee pulp.] West Indië 6: 24–27. 1921.—Use of coffee pulp as (1) manure, (2) fuel, and (3) in the manufacture of alcohol is advised.—*J. C. Th. Uphof.*

4111. Allen, W. J., and S. A. Hogg. **The drying of prunes, currants, sultanas, and raisins.** Agric. Gaz. New South Wales 34: 135–138. 1923.

4112. Azoulay, Léon. **Le commerce et l'industrie des champignons secs en France et à l'etranger.—Mesures à prendre pour prevenir les empoisonnements qu' ils peuvent causer.** [The dried mushroom trade in France and elsewhere.—Precautions necessary to prevent poisoning.] Bull. Trimest. Soc. Mycol. France 38: 117–122. 1922.—The report of a committee regarding the preparation and sale of dried mushrooms is given.—*D. S. Welch.*

4113. Azoulay, Léon. **Proposition de loi ayant pour object de prevenir les empoisonnements dus aux champignons mis en vente et à ceux cueillis par les particuliers.** [Legislation for the prevention of poisoning by mushrooms placed on sale or collected for individual use.] Bull. Trimest. Soc. Mycol. France 38: 109–116. 1922.—Information is included as to the extent and seriousness of mushroom poisoning, methods of prevention by public advertising, inspection, sales regulation, licences, and other means of protecting the public. The text of the proposed law is given.—*D. S. Welch.*

4114. Georgi, C. D. V. **Oil from Aleurites species.** Malayan Agric. Jour. 10: 202–205. 1923.—The very hard nut of *Aleurites moluccana* may be most conveniently cracked by heating at 130–140°C. for 1 hour and then soaking in cold water. The yield of oil is given, also its constants.—*I. H. Burkill.*

4115. Georgi, C. D. V. **Some Malayan oils and fats of minor importance.** Malayan Agric. Jour. 10: 222–227. 1923.—This gives the amount of oil and its constants in seed of *Bertholletia excelsa, Calophyllum inophyllum, Croton tiglium, Nephelium mutabile,* and *N. lappaceum,* locally produced.—*I. H. Burkill.*

4116. Power, Frederick B., and Victor K. Chesnut. **Examination of authentic grape juice for methyl anthranilate.** Jour. Agric. Res. 23: 47–53. 1923.—This ester is found in all varieties examined which are of *labrusca* origin and also in hybrid varieties in which this species predominates. Juices from varieties of *Vitis rotundifolia* from southern U. S. A., from *V. vinifera* from California, and from 1 sample of juice of *V. bourquiniana* did not have the ester.—*D. Reddick.*

4117. Thommen, Gustave. **Notes on the fern leaf industry.** Amer. Fern Jour. 12: 122–125. 1922.—Fern leaves are collected in the fall and stored in cold frames or refrigerating places at a temperature of 31–32°F. Before they reach the market there is often a loss of 50–75 per cent, the cause of which is not understood.—*F. C. Anderson.*

MORPHOLOGY, ANATOMY AND HISTOLOGY OF VASCULAR PLANTS

E. W. Sinnott, *Editor*

(See also in this issue Entries 3749, 3766, 3816, 3829, 3841, 3908, 3931, 3967, 4073, 4255, 4342, 4349, 4352, 4397, 4402, 4511, 4568, 4571, 4575, 4584, 4603, 4666, 4715)

4118. Albeggiani, Elisabetta. **Misure ed osservazioni comparative sullo sviluppo in superficie degli organi fogliari e radicali.** [Comparative measurements and observations on development of leaf and root systems.] Bull. R. Orto Bot. Palermo 2:157–170. 1921.—The extent of leaf and root surfaces was estimated for a number of plants of different species (*Urtica dioica, Tropaeolum majus, Helianthus annuus, Chenopodium album, Ricinus communis, Portulaca oleracea, Phaseolus vulgaris, Mercurialis annua*, etc.). Results indicated that the leaf surface is usually greater than that of the roots, and sometimes twice as great. The two tend to be equal when plants are young, but with maturity the leaf surface increases more rapidly than that of the roots.—*Edith K. Cash.*

4119. Bailey, Irving W. **The anatomy of certain plants from the Belgian Congo, with special reference to myrmecophytism.** Bull. Amer. Mus. Nat. Hist. 45: 585–621. *Pl. 30–45.* 1922.—Studies were made of *Vitex Staudii, Cuviera* sp., *Plectronia Laurentii, P.* sp., *Barteria fistulosa, B. dewevrei*, and *Sarcocephalus* sp.—The food of twig-inhabiting ants is described. Theories of myrmecophily and myrmecophytism are discussed, with the following conclusion: "Certain plants tend—for reasons which are at present obscure—to form extrafloral nectaries, food-bodies, prostomata, saccate leaves, fistulose branches, and other pseudodomatia, etc. In many cases, but by no means in all, these structural modifications of plants are taken advantage of by ants in their search for food and domatia. The myrmecophytic relationship which results is purely a case of parasitism in which all the advantage lies with the ants."—The origin of pseudo-gall forming habit is discussed.—*Frank E. Lutz.*

4120. Baure, Raphael. **Entwickelungsgeschichtliche Untersuchungen an Polygonaceenblüten.** [Development of the flower in the Polygonaceae.] Flora 115: 273–292. *Pl. 2–3.* 1922.—The floral plan of the Polygonaceae is 5-merous, not 3-merous. It is doubtful whether the Eriogoneae should be classed with the Polygonaceae.—*A. G. Stokey.*

4121. Becquerel, Paul. **La théorie de meriphyte devant les phénomènes de l'ontogénie vasculaire.** [The theory of the meriphyte in the light of the phenomena of vascular ontogeny.] Compt. Rend. Acad. Sci. Paris 175: 233–235. 1922.—The author discusses the validity of Chauveaud's theory of vascular evolution. He supports the conclusions of Chauveaud as based on many species of the higher plants, and criticizes Bugnon for confining his studies to a single species.—*C. H. Farr.*

4122. Böning, Karl. **Ueber den inneren Bau horizontaler und geneigter Sprosse und seine Ursachen.** [The inner structure of horizontal and bent shoots and its causes.] Ber. Deutsch. Bot. Ges. 40: 279–282. 1922.—This is a report of observations upon anatomical differences in the tissues produced in eccentric radial growth of horizontal shoots of many herbaceous and woody plants. The author suggests that the unequal growth on the upper and lower side of shoots is due to mechanical stretching on the upper side, and pressure on the lower side. Any difference on the 2 sides of the shoot is usually due to differences in the xylem elements, which have slightly lignified and much thickened walls on the upper side, and the reverse on the lower side. Eccentric radial growth was found most commonly in trees and least commonly in herbs.—*W. C. Muenscher.*

4123. Bouvrain, Georges. **Sur l'évolution vasculaire dans la Mercuriale.** [On the vascular development of Mercurialis.] Compt. Rend. Acad. Sci. Paris 175: 380–382. 1922.—The author defends the interpretation of Chauveaud, as opposed to that presented by Bugnon [see Bot. Absts. 12, Entries 4125, 4126, 4127, 4129.]—*C. H. Farr.*

4124. Bruyne, C. de. **Idioblastes et diaphragmes des Nymphéacées.** [Idioblasts and diaphragms of the Nympheaceae.] Compt. Rend. Acad. Sci. Paris 175: 452–455. 1922.—*Nuphar luteum, Nymphaea alba, N. lotus,* and *Victoria regia* were studied. Contrary to the report of certain authors, all of the Nympheaceae are provided with partitions in the aeriferous canals, either in all parts or only in the root. The idioblasts are branching sclerenchymatous cells.—*C. H. Farr.*

4125. Bugnon, P. **L'organisation liberoligneuse chez la Mercuriale reproduit-elle une disposition ancestrale?** [Is the fibro-vascular organization of Mercurialis an ancestral arrangement?] Compt. Rend. Acad. Sci. Paris 174: 1484–1486. *Fig. 1 (i–iv).* 1922.—A continuation of a previous study [Ibid. 174: 1194. 1922]. A study is made of the fundamental difference between the vascular organization at the base of the cotyledon and at the base of the vegetative leaves. It is found in opposition to Chauveaud, that the 2 regions are identical in their principal characteristics; differences are of secondary importance.—*C. H. Farr.*

4126. Bugnon, P. **Sur l'accélération basifuge dans l'hypocotyle.** [The basifugal acceleration of the hypocoty.] Compt. Rend. Acad. Sci. Paris 175: 43–45. 1922.—Chauveaud's interpretation [see Bot. Absts. 12, Entry 4129] of the anatomy of the hypocotyl of *Mercurialis* as opposed to the author's interpretation is discussed [see preceding entry]. It is concluded that the basifugal acceleration theory is based on the postulate of the initial continuity of the embryonic conductive apparatus. It does not explain the character common to the centripetal and centrifugal protoxylem. Certain vessels in the hypocotyl region are destroyed, in the course of germination, by the intercalary growth of the region. [See also Bot. Absts. 12, Entry 4123.]—*C. H. Farr.*

4127. Bugnon, P. **Sur la différenciation vasculaire basipéte pour toutes les traces foliaires chez la Mercuriale.** [On the basipetal vascular differentiation of all the foliar traces in Mercurialis.] Compt. Rend. Acad. Sci. Paris 175: 897–899. *7 fig.* 1922.—Figures and descriptions are given of the leaf traces at 6 levels. The author regards Chauveaud's theory [see Bot. Absts. 12, Entry 4129] of basifugal acceleration as unnecessary to explain the basipetal vascular differentiation of the hypocotyl of *Mercurialis.* [See also Bot. Absts. 12, Entry 4123.] —*C. H. Farr.*

4128. Bugnon, P. **Sur la position systématique des Euphorbiacées.** [On the systematic position of the Euphorbiaceae.] Compt. Rend. Acad. Sci. Paris 175: 629–632. *Fig. 1–2.* 1922.—This family is placed by some in the Apetalae next to the Urticales, and by others in the Dialypetalae next to the Malvales. Wettstein considers it transitional between the Apetalae and the Dialypetalae. In embryological characters, especially the venation of the cotyledons, the Euphorbiaceae seem to be closely related to the Sterculiaceae, a family of the Malvales.—*C. H. Farr.*

4129. Chauveaud, Gustave. **Les principales variations du développement vasculaire dans les premières phyllorhizes des phanérogames ne sont pas déterminées par l'accroissement intercalaire.** [The principal variations in the vascular development of the primary phyllorhiza of phanerogams are not determined by intercalary growth.] Compt. Rend. Acad. Sci. Paris 174: 1487–1489. 1922.—A study was made of the vascular variations in parts of the seedlings of *Ricinus* and *Mercurialis.* In *Ricinus* the basifugal accelerations are more marked than in *Mercurialis.*—*C. H. Farr.*

4130. Costantin, J. **Sur les croix de Malte présentées par les bois soumis à des traumatismes.** [The Maltese cross seen in wood after wounding.] Compt. Rend. Acad. Sci. Paris

174: 1313-1316. 1922.—This phenomenon is most evident in chestnut, but also in certain species of *Acer*, *Staphylea*, black alder, dogwood, oak, ash, and service-tree. Advantage is taken of it in treating wood preparatory to making canes, pen holders, and similar articles. A large number of superficial cicatrices of the cortex are made Mar. 15–Apr. 15. The pattern of the section varies with the manner of making the cuts and the kind of wood.—*C. H. Farr.*

4131. Denham, H. J. **The structure of the cotton hair and its botanical aspects.** British Cotton Indust. Res. Assoc. Shirley Inst. Mem. 1: 87–100. 1922. [See Bot. Absts. 12, Entry 537.]

4132. Fischer, Hugo. **Anemone alpina L. mit monstrosem Blütenhüllblatt.** [**Anemone alpina L. with an abnormal perianth lobe.**] Ber. Deutsch. Bot. Ges. 37: 476–478. *Fig. 1.* 1919.—An abnormal perianth lobe of *Anemone alpina* is described. The possible origin of perianth lobes from green leaves is discussed.—*W. C. Muenscher.*

4133. Gandrup, Johannes. **Over den steencellenring in de schors van Hevea.** [**The stone-cell ring in the cortex of Hevea.**] Arch. Rubbercult. 5: 465–471. 1921.—The stone-cell ring develops from, and replaces, a ring of bast fibers.—*C. D. La Rue.*

4134. Gandrup, Johannes. **Over der kurklaag van Hevea schors.** [**The cork layer of Hevea bark.**] Arch. Rubbercult. 5: 389–396. 1921.—The method of formation of cork is discussed. Tissues of the bark affected with brown bast disease will not be cut off by cork formation.—*C. D. La Rue.*

4135. Gatin, C. L. **Première contribution à l'étude de l'émbryon et de la germination des Aracées.** [**Embryo and germination in the Araceae.**] Ann. Sci. Nat. Bot. X, 3: 145–169. *Pl. 1–10.* 1921.—Ten genera of the family are considered. The embryo is an undifferentiated proembryonal mass in *Caladium*, but more or less differentiation is shown in other genera. The endosperm is lacking in the mature seed in some genera. The vascular tissue is described as showing much variation in form. The primary root of the seedling often fails to develop, its place being taken by secondary roots, which may be formed before the maturity of the seed. Polyembryony, or at least the production of more than 1 embryonal axis in a single seed, is noted in *Aglaonema* and *Dieffenbachia.*—*Paul Weatherwax.*

4136. Geisenheyner, L. **Ueber eine monströse Linaria vulgaris.** [**A monstrositiy in Linaria vulgaris.**] Ber. Deutsch. Bot. Ges. 37: 479–484. *Fig. 1–2.* 1919.—The flower and inflorescence is described. [See also Bot. Absts. 12, Entry 4138.]—*W. C. Muenscher.*

4137. Gertz, Otto. **Ueber septierte Stomazellen.** [**Septate guard cells.**] Ber. Deutsch. Bot. Ges. 37: 329–334. *Fig. 1–16.* 1919.—Stomata with more than 2 guard cells and other stomatal abnormalities are described and illustrated for a number of plants.—*W. C. Muenscher.*

4138. Graf, Jacob. **Eine abnorme Blütenbildung bei Linaria vulgaris.** [**An abnormal flower structure in Linaria vulgaris.**] Ber. Deutsch. Bot. Ges. 37: 485–489. *Pl. 7.* 1919.—A study of the structure of the abnormal flowers of *Linaria vulgaris* described by Geisenheyner [see Bot. Absts. 12, Entry 4136] is reported.—*W. C. Muenscher.*

4139. Gyorffy, I. **Keimlinge der Weisstanne mit Doppelblättern.** [**Seedlings of white fir with double leaves.**] Ber. Deutsch. Bot. Ges. 39: 123–125. *Fig. 1.* 1921.—Four seedlings of *Abies alba* with double or forked cotyledons are described and pictured.—*W. C. Muenscher.*

4140. Hastings, G. T. **Rudimentary sporangia on the royal fern.** Torryea 23: 10. 1923. In May, 1922, many plants of *Osmunda regalis* showed a tendency for all fronds to be fertile, over ½ of the plants bearing rudimentary sporangia on the upper pinnae of the sterile fronds. These were about ⅓ the size of normal sporangia, and were in all stages of development. Later in the season no sporangia were observed.—*J. C. Nelson.*

4141. Heimlich, Louis F. **Peloria in Linaria and other plants.** Proc. Indiana Acad. Sci. **1921:** 111–116. *Fig. 1–12.* 1922.—On more than a dozen plants of *Linaria vulgaris* Hill all flowers had 5 spurs instead of 1. Others noted were *Delphinium belladonna*, with 1 sepal divided and leaflike; *Calendula officinalis* L., with some of the small flowers changed into small heads on long pedicels; *Picea excelsa* L., which produced from a terminal bud a cone containing small loose scales with large microsporangia at the base and a middle zone of sterile scales resembling megasporophylls.—*F. C. Anderson.*

4142. Heinricher, E. **Ueber die Blüten und die Bestäubung bei Viscum cruciatum Sieb.** [The flowers and pollination of Viscum cruciatum.] Ber. Deutsch. Bot. Ges. 40: 168–173. *Fig. 1–2.* 1922.—The general structure of the small and inconspicuous flowers, the failure to find nectar, and the echinate but not sticky pollen in *Viscum cruciatum*, all suggest wind pollination rather than insect pollination.—*W. C. Muenscher.*

4143. Herzfeld, Stephanie. **Ephedra campylopoda Mey. Morphologie der weiblichen Blüthe und Befruchtungsvorgang.** [Ephedra campylopoda Mey. Morphology of the female flower and fertilization.] Denkschr. Akad. Wiss. Wien Math.-Nat. Kl. 98: 243–268. *Pl. 1–2.* 1922.—This species has 2 kinds of female flowers—those borne upon strictly female plants and having only ovules, and those in which the ovulate flowers have some stamens below the ovule. In both, a ring of tissue develops at the base of the nucellus, but subsequently an integument which is prolonged into the long micropyle characteristic of Gnetales develops in the normal flower, while in the modified female flower the development of the integument is more or less abortive or distorted. The ring of tissue below the integument is neither sporophyll, integument, nor perianth, but an organ "sui generis" and homologous with the actinomorphic fertile scales (Fruchtschuppen) of the Taxaceae.—The development of the female gametophyte is normal. All the cells of the upper layer are potential archegonium initials, but the usual numbers developing are 3–5 with 1–6 as the limits. No wall is formed between the ventral canal nucleus and the egg, not even spindle fibers being distinguishable.—The pollen grain at the shedding stage contains 1 prothallial cell, 2 "wall cells," a tube cell, and an "antheridial" cell which, later, gives rise to 2 male cells. One of the male nuclei fuses with the ventral canal nucleus, and the other unites with the egg nucleus. This is described as double fertilization. The author believes that such fusions, described by several students of gymnosperms as occasional occurrences, belong to the same category and constitute a step toward true double fertilization. She found no embryo developing as a result of the fertilization of the ventral canal nucleus.—The reduced condition of the female gametophyte of *Ephedra*, when compared with that of other Gnetales, indicates the way to the origin of the embryo-sac of angiosperms.—The chromosome number of the gametophyte is 6 and that of the sporophyte, 12—just 1/2 the number which is almost universal in gymnosperms.—*Charles J. Chamberlain.*

4144. Kostytschew, S. **Der Bau und das Dickenwachstum der Dikotylenstämme.** [The structure and growth in thickness of the stem of dicotyledons.] Ber. Deutsch. Bot. Ges. **40:** 297–305. *Fig. 1–10.* 1922.—The arrangement of the procambium determines the shape of the stem in dicotyledons. A continuous ring of procambium develops into a solid cylinder of wood and phloem; isolated groups of procambium develop into distinct vascular bundles. Only the earliest formed cambium ring develops wood and phloem; the interfascicular cambium developed in a few plants produces only parenchyma, which is not identical with the medullary ray tissue formed in a continuous woody ring. The leaf traces in a young cylinder are easily distinguished from the true vascular bundles. These leaf traces are independent morphological units, being purely the result of a correlation between leaf and stem development. The strips of procambium between each leaf trace are often mistaken for interfascicular cambium, giving rise to serious errors.—*C. L. Wilson.*

4145. La Rosa, Angelina. **Il periderma picciolare di alcune specie di Ficus.** [The petiolar periderm of some species of Ficus.] Bull. R. Orto Bot. Palermo **2:** 149–156. 1921.—The species studied, growing in the Palermo Botanical Garden, are as follows: *Ficus saus-*

sureana, F. leucontathoma, F. quercifolia, F. glomerata, F. policarpa, F. Sycomorus, F. Vagneri, F. Neumanni, F. gigantea, F. salicifolia, F. laurifolia, F. capensis and *F. vasta*. The periderm of the leaf petioles in every case was found to develop from the layer of cells immediately beneath the epidermis, the brown, withered walls of the epidermal cells persisting on the surface. The periderm of the branches is formed at the same time or slightly later than that of the petioles, and likewise originates from the subepidermal tissue, but continues to increase in thickness after the leaves have fallen. The early formation of periderm in the leaf petioles of exotic species of *Ficus* serves to limit transpiration and aid in protecting the leaf tissues from drying.—*Edith K. Cash.*

4146. Lavialle, P., et J. Delacroix. **La paroi du pistil et du fruit dans le genre Euphorbia. [The wall of the pistil and the fruit of the genus Euphorbia.]** Compt. Rend. Acad. Sci. Paris **175:** 179–181. 1922.—Detailed descriptions of these organs are given. In the structure of the ovary and fruit, the Euphorbiaceae are believed to show a relationship to the Malvaceae, especially to the tribe Bombaceae. In like manner they seem to be related to the Rutaceae.—*C. H. Farr.*

4147. Mirande, Marcel. **Sur l'origine morphologique du liber interne des Nolanacées et la position systématique de cette famille. [The morphological origin of the internal wood of the Nolanaceae and the systematic position of this family.]** Compt. Rend. Acad. Sci. Paris **175:** 375–376. 1922.—The vascular structure of 3 species of *Nolana* is described. In the characters here studied this family is more like the Solanaceae than the Convolvulaceae, and it is suggested that the family be placed between the Boraginaceae and the Solanaceae.—*C. H. Farr.*

4148. Neger, F. W. **Beiträge zur Kenntnis des Baues und der Wirkung der Lentizellen II. [Structure and function of lenticles II.]** Ber. Deutsch. Bot. Ges. **40:** 306–313. *Fig. 1–2.* 1922.—In this 2nd paper [see Bot. Absts. 9, Entry 872] the author describes the lenticels on the aerial roots of *Philodendron* and discusses the literature. Lenticel-like intumescences on the lower surface of the phyllodia of species of *Acacia* are interpreted as adaptations which function as stomata in the exchange of gases under greenhouse conditions.—Infections were produced through lenticels on twigs of *Acer* and *Aesculus* which had been inoculated with pure cultures of conidia of *Nectria cinnabarina.*—*W. C. Muenscher.*

4149. Nicolas, G. **Contribution à l'étude des synanthies. [Contribution to the study of synanthy.]** Rev. Gén. Bot. **35:** 49–56. 1923.—Synanthy as found in *Narcissus Tazetta* was studied morphologically and anatomically. The author is of the opinion that synanthy may be caused by deficient nutrition.—*J. C. Gilman.*

4150. Rimbach, A. **Lebensweise von Chloraea membranacea. [Seasonal growth of Chloraea membranacea.]** Ber. Deutsch. Bot. Ges. **40:** 322–326. *Fig. 1–6.* 1922.—The author describes the growth of this orchid from seed sown in flower pots. Under natural conditions in Uruguay, the leaves appear in March on the rhizome which has remained dormant during the warm, dry January and February. In August the leaves begin to die and by October the inflorescence appears from among the dying leaves. Blossoming begins in November and lasts about 3 weeks. After the fruit matures and the seed are disseminated, in December, the fruit stalk drops off and the plant remains dormant, without aerial organs, through the summer.—*W. C. Muenscher.*

4151. Schürhoff, P. N. **Zur Phylogenie des angiospermen Embryosacs. [Phylogeny of the embryo-sac in angiosperms.]** Ber. Deutsch. Bot. Ges. **37:** 161–169. 1919.—Various views regarding the significance of the contents of the mature embryo-sac of angiosperms are discussed, but none offer any explanation of the derivation of this organ from the female haploid generation of gymnosperms. According to the author the egg corresponds to the egg of gymnosperms. One synergid is the homologue of the ventral canal cell; the other is a later delimited cell of the many-nucleate prothallium. The polar nuclei are the remains of the many-nucleated, cellular, undifferentiated prothallium. The antipodals correspond to the cellular prothallium of gymnosperms.—*W. C. Muenscher.*

4152. Schürhoff, P. N. **Zur Polyembryonie von Allium odorum.** [Polyembryony in Allium odorum.] Ber. Deutsch. Bot. Ges. 40: 374–381. 1923.—A large number of embryos occur in the antipodal end of many embryo sacs of *Allium odorum* which possess the diploid number of chromosomes, in contrast with the haploid condition present in the normal embryo-sac nuclei. These antipodal embryos are adventitious embryos originating from the vegetative budding of the outer layers of the inner integument of the nucellus.—*M. E. Stratton.*

4153. Souèges, René. **Embryogénie des Caryophyllacées. Les premiers stades du développement de l'embryon chez le Sagina procumbens L.** [Embryogeny of the Caryophyllaceae. The early stages in the development of the embryo of Sagina procumbens.] Compt. Rend. Acad. Sci. Paris **175:** 709–711. *Fig. 1–18.* 1922.—A figure of each successive cell-division is given accompanied by a careful description of each stage. [See also following entry.] —*C. H. Farr.*

4154. Souèges, René. **Embryogénie des Caryophyllacées. Les derniers stades du développement de l'embryon chez le Sagina procumbens L.** [Embryogeny of the Caryophyllaceae. The later stages in the development of the embryo of Sagina procumbens.] Compt. Rend. Acad. Sci. Paris **175:** 894–896. *Fig. 19–34.* 1922.—This continuation [see preceding entry] carries the embryo to the final stage, as it is found in the seed.—*C. H. Farr.*

4155. Souèges, René. **Embryogénie des Malvacées. Développement de l'embryon chez le Malva rotundifolia L.** [Embryogeny of the Malvaceae. Development of the embryo of Malva rotundifolia.] Compt. Rend. Acad. Sci. Paris **175:** 1435–1436. *Fig. 1–14.* 1922.—The author describes and figures the development of the embryo of this species. This is found to be absolutely identical with that of *Senecio vulgaris* and *Urtica pilulifera.*—*C. H. Farr.*

4156. Souèges, René. **Recherches embryogéniques sur l'Hippuris vulgaris L.** [Embryological researches on Hippuris vulgaris.] Compt. Rend. Acad. Sci. Paris **175:** 529–532. *Fig. 1–17.* 1922.—The development of the embryo of this plant is much like that of *Veronica arvensis.*—*C. H. Farr.*

4157. Spessard, Earl Augustus. **Prothallia of Lycopodium in America II. L. lucidulum and L. obscurum var. dendroideum.** Bot. Gaz. **74:** 392–413. *Pl. 16–18.* 1922.—Prothallia of *L. lucidulum* were found in quantity at certain stations in Michigan. They occur in small patches from 1 of which 153 individuals were taken. The habitat is drier than that occupied by the adult sporophytes. The sporophytes migrate to moister conditions through gemmae originating from occasional survivals of egg-initiated sporophytes in wet years. Histological studies of the prothallia are presented. The prothallia are monoecious, the sex organs appearing in acropetal succession.—The prothallia of *L. obscurum* var. *dendroideum* are much rarer, only 37 being found here. They occur in soils very diverse with regard to humus content, but soils which the author believes to be slightly drier than those carrying the sporophytes. The antheridia, and to a less extent the archegonia, occur in unusually large masses, the excess size of which may be related to the influence of the symbiotic fungus which was noted to invade this region. In *L. lucidulum* spore-like bodies of an endophytic fungus are present in half of the cells, the other half carrying the mycelium. This condition does not obtain in *L. obscurum,* where all the cells bear mycelial material. The taxonomic position of the fungi is still in doubt but the writer regards them as Ascomycetes rather than Oomycetes, as others have heretofore done.—*B. W. Wells.*

4158. Stomps, Theo. J. **Blattbecher, Sprossbecher und Stengelbecher.** [Leaf-pitchers, shoot-pitchers and stem-pitchers.] Ber. Deutsch. Bot. Ges. **40:** 264–268. 1922.—A brief discussion is given of what appear to be misinterpretations of some of the author's views regarding the nature and origin of certain pitcher-like modifications of some plant organs.—*W. C. Muenscher.*

4159. Vuillemin, Paul. La petalosteme. [The petalostem.] Compt. Rend. Acad Sci. Paris 175: 553–551. 1922.—The portion of the flower which the petals and stamens comprise is termed the petalostem. It is considered to originate from the frond, rather than from the leaf, as do the sepals and floral bracts. Petals and stamens may intergrade, but their metamorphoses into sepals is regarded as illusory. An evolutionary series of floral types is given which sets forth the transformations of the petalostem.—*C. H. Farr.*

MORPHOLOGY AND TAXONOMY OF ALGAE

E. N. Transeau, *Editor*

L. H. Tiffany, *Assistant Editor*

(See also in this issue Entries 3747, 3772, 3779, 3814, 4187, 4232, 4234, 4471, 4488, 4510, 4566, 4585, 4529, 4634, 4683, 4705, 4713)

4160. Hamel, G. Sur quelques particularités de la flore algologique de Saint-Malo. [On certain particulars in the algal flora of Saint-Malo.] Compt. Rend. Acad. Sci. Paris 175: 1091–1093. 1922.—*Codium Bursa, Cladophora prolifera,* and *Solieria chordalis* are reported for this locality and their distribution is discussed. Certain other species are reported from this vicinity as their northern limit, such as *Gelidium sesquipedale, Gigartina Teedii, Polysiphonia subulifera,* and *Zanardinia collaris.*—*C. H. Farr.*

4161. Nicolas, G. Un nouvel hôte du Phyllosiphon Kühn. [A new host for Phyllosiphon.] Compt. Rend. Acad. Sci. Paris 175: 46–47. 1922.—This siphonaceous alga is a parasite on the leaves of certain aroids. *Phyllosiphon Arisari* has been known to occur on 2 species of *Arisarum* and on *Arum maculatum.* It is now found in Algeria on *Arum italicum.* A description of the appearance of the parasite and the host is given.—*C. H. Farr.*

4162. Puymaly, A. de. Adaptation à la vie aérienne d'une Conjuguée filamenteuse (Zygnema peliosporum Wittr.). [The adaptation to aerial life of a filamentous conjugate, Zygnema peliosporum.] Compt. Rend. Acad. Sci. Paris 175: 1229–1231. 1922.—This alga, resembling *Zygnema Ericetorum* var. *terrestre,* grows on the ground forming a webby structure. The filaments secrete a gelatin which agglutinates the threads together and effectively resists desiccation. Reproduction is by akinetes; zygospores are rare.—*C. H. Farr.*

4163. Taylor, Wm. Randolph. Recent studies of Phaeophyceae and their bearing on classification. Bot. Gaz. 74: 431–441. 1922.—After a review of recent work on the life histories of Phaeophyceae by Sauvageau, Drew, Killian, Williams, Kylin, Kuckuck, Pascher, and Ikari, the author proposes a classification of the group based on the newer morphological findings. The orders Phaeosporales and Cyclosporales are retained. The former is divided into 3 suborders, (1) Ectocarpineae (8 families), with morphological alternation of similar generations shown or inferred to be present; (2) Dictyosiphonineae (1 family), with morphological alternation of dissimilar generations present or inferred, the sporophyte exceeding the game tophyte in size; (3) Cutlerineae (1 family), with morphological alternation of similar or dissimilar generations present, gametophyte, when different, larger thanthe sporophyte, growth trichothallic. The order Cyclosporales is divided into 3 suborders each with one family: (1) Dictyotineae, with morphological alternation of similar generations; (2) Laminarineae, with morphological alternation of dissimilar generations, gametophyte smaller than the sporophyte; (3) Fucineae, with only cytological alternation of generations.—*I. F. Lewis.*

MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

Alexander W. Evans, *Editor*

(See also in this issue Entries 3754, 3755, 3779, 4246, 4629, 4634, 4683)

4164. Amann, J. Fissidens Mnevidis Amann, sp. nova. Rev. Bryologique 49: 51. 1922. —The new species described under the above name was based on material collected by P. Jaccard in the valley of the Nile, Egypt. It is assigned to the section Bryoideum C.M.—*A. W. Evans.*

4165. Amann, J. **Le Cinclidotus danubicus en Suisse.** [Cinclidotus danubicus in Switzerland.] Rev. Bryologique 49: 49, 50. 1922.—The discovery of *Cinclidotus danubicus* Schiffner & Baumgartner, a species new to Switzerland, is announced on the basis of specimens collected by E. Seiger at Basel. The species is briefly characterized, and the cellular indices of the various European species of *Cinclidotus* are tabulated.—*A. W. Evans.*

4166. Andrews, A. LeRoy. **Additions to the bryophyte flora of Iceland.** Bryologist 26: 4. 1923.—The author reports 1 hepatic and 2 mosses as additions to the list given by Hesselbo in the Bryophyta of Iceland [see Bot. Absts. 1, Entries 470, 1040].—*E. B. Chamberlain.*

4167. Andrews, A. LeRoy. **The status of Gyroweisia in North America.** Bryologist 25: 97–100. 1922.—*Gyroweisia* as a generic name has no valid status as it is antedated by *Weisiodon* Schimp. *Gyroweisia tenuis* Schimp. does not occur in North America, reports of it being due to errors in determination. *G. Barbula* (Schwaegr.) Par., *G. brevicaulis* (Hpe.) Broth., *G. obtusifolia* (Hpe.) Broth., and *G. barbulacea* (C. M.) Broth., all species of tropical America, do not belong in the genus, and their exact status is at present uncertain. If *Weisiodon* is extended beyond its original application, it should probably include *Dactylhymenium Pringlei* (E. G. Britton) Card. of Mexico, *Gyroweisia boliviana* R. S. W. of the Andes, and *Didymodon tophaceus* (Brid.) Jur. of western North America.—*E. B. Chamberlain.*

4168. Andrews, A. LeRoy. **Two additions to the Bermuda flora.** Bryologist 26: 6. 1923.—The author reports *Octoblepharum albidum* (L.) Hedw. and *Bryum murale* Wils. as additions to the flora of Bermuda and notes new localities for 2 other mosses and for 2 hepatics.—*E. B. Chamberlain.*

4169. Britton, Elizabeth G. **Notes on Fissidens, II.** Bryologist 26: 1. 1923.—*Fissidens palmatus* (Sw.) Hedw. is apparently endemic in Jamaica and known only from the original collection. Material from St. Thomas and Cuba reported under the above name belongs to *Fissidens Kegelianus* C. M., a common species of subtropical and tropical America. The synonymy and distribution of the latter species are outlined.—*E. B. Chamberlain.*

4170. Conklin, Geo. Hall. **Report of the Curator of the Hepatic Herbarium.** Bryologist 26: 10–11. 1923.—In recapitulating the additions to the herbarium of the Sullivant Moss Society, the author mentions localities for a few uncommon hepatics.—*E. B. Chamberlain.*

4171. Dismier, G. **Note sur le Zygodon conoideus (Dicks.) Hook. et Tayl., d'après le travail M. N. Malta.** [Note on Zygodon conoideus, based on the work of Mr. N. Malta.] Rev. Bryologique 49: 61–64. 1922.—The author reviews a recent paper by Malta on the distribution of *Zygodon conoideus* [see Bot. Absts. 11, Entry 2671] and cites the species from several additional localities in France, 7 different departments being represented. He calls particular attention to the propagula of *Zygodon*, as described by Malta, and emphasizes the importance of these organs in distinguishing closely related species.—*A. W. Evans.*

4172. **Локтуровскій, В. С.** [Docturowsky, W. S.] Мхи торФяныхъ болотъ Полѣсья Минской и Волынской губ. [The mosses of the peat bogs of Polesia in the Provinces Minsk and Wolyn.] Вѣстникъ торФяного Дѣла [Reports on Peat] 3/4. 1916. [With French summary.]—In this paper 111 species of mosses are listed, 23 belonging to the genus *Sphagnum*, and their distribution in various associations is described. The determinations were made by V. F. Brotherus and H. Lindberg.—*W. S. Docturowsky.*

4173. Gardet, G. **Sur l'extension vers l'Est, d'une bryacée d'allure méridionale: Conomitrium Julianum Montagne.** [On an extension toward the East of a bryophyte having a southern appearance: Conomitrium Julianum.] Rev. Bryologique 49: 65, 66. 1922.—The author records the discovery of the aquatic *Conomitrium Julianum* at Jussey (Haute-Saône) and at Voisy (Haute-Marne), these stations extending the known range of the species into the eastern part of France.—*A. W. Evans.*

4174. Loeske, L. **Haplolepideen und Diplolepideen in bryo-systematischer Beziehung.** [Haplolepideae and Diplolepideae fron the standpoint of moss taxonomy.] Bot. Archiv 4: 110–112. 1923.—The distinctions between the Haplolepideae and the Diplolepideae are based on differences in the peristome and were first pointed out by Philibert in 1884. In the typical Haplolepideae the peristome is single and each tooth is derived from 1 external row of cells and 2 internal rows; in the typical Diplolepideae the peristome is double and each tooth of the outer peristome is derived from 2 external rows and 1 internal row. In the author's opinion these distinctions have been much overrated by taxonomists, and peristomes of identical structure may sometimes be found in genera that would not be considered closely related, if their gametophytic characters were taken into consideration. Similarity in the structure of the peristome may therefore represent a convergence-phenomenon and have but little phylogenetic significance.—*A. W. Evans.*

4175. Lorenz, Annie. **Some Hepaticae from Grand Manan N. B.** Bryologist 26: 5. 1923.—A list of 25 species from the island of Grand Manan, New Brunswick, is given, the local distribution of each species being indicated. The report is based on a collection made in 1922 by W. R. Taylor and the only rarity included is *Diplophyllum albicans* (L.) Dum.—*E. B. Chamberlain.*

4176. Nicholson, W. Edw. **Mosses and hepatics near Aviemore, East Inverness.** Rev. Bryologique 49: 54–58. 1922.—The region reported upon was explored by the author and H. H. Knight during July, 1921. It is situated about midway between the east and west coasts of Scotland and is too dry to yield a full representation of the so-called Atlantic species, only 3 of which were collected. The mosses enumerated number 34 and the hepatics 58. Each species is accompanied by data regarding stations, and occasional critical remarks are interpolated.—*A. W. Evans.*

4177. Pearson, Wm. Hy. **Swiss hepatics.** Rev. Bryologique 49: 59–61. 1922.—A small collection of Hepaticae made in July, 1922, by P. G. M. Rhodes in the St. Bernard region of Switzerland is reported upon. The species listed number 15 and are accompanied by full data regarding localities and occasionally by critical remarks. Under *Lophozia Lyoni* (Tayl.) Steph. the new variety *subaequiloba* Meylan is described.—*A. W. Evans.*

4178. Trabut, L. **Deux Funariacées nouvelles.** [Two new Funariaceae.] Rev. Bryologique 49: 64, 65. *2 fig.* 1922.—The author describes and figures 2 new Algerian mosses under the names *Funaria deserticola* and *Physcomitrium longicollum,* comparing the Funaria with *F. attenuata* and the Physcomitrium with *P. acuminatum.*—*A. W. Evans.*

4179. Williams, R. S. **Brachymenium condensatum, sp. nov.** Bryologist 26: 2–3. *Pl. 1.* 1922.—A new moss from Mexico is described and figured under the above name. The species was based on material collected by C. G. Pringle at Patzuaro (No. 762) and is allied to *B. imbricatifolium* C. M.—*E. B. Chamberlain.*

4180. Yuncker, T. G. **Additions and corrections to the list of Indiana mosses.** Proc. Indiana Acad. Sci. 1921: 155, 156. 1922.—The author's list of Indiana mosses has already been abstracted [see Bot. Absts. 10, Entry 997]. In the present paper 7 additional species and varieties for Indiana and 18 for Monroe County are enumerated, and 6 records in the earlier list are corrected. The additions are taken from a paper published by F. L. Pickett in 1915.—*F. C. Anderson.*

MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA, AND MYXOMYCETES

H. M. Fitzpatrick, *Editor*
D. S. Welch. *Assistant Editor*

(See also in this issue Entries 3733, 3748, 3766, 3797, 3829, 4112, 4113, 4157, 4260, 4261, 4265, 4270, 4282, 4284, 4289, 4295, 4302, 4303, 4310, 4314, 4315, 4316, 4324, 4335, 4341, 4346, 4351, 4409, 4444, 4445, 4448, 4505, 4560, 4565, 4579, 4629, 4634, 4683, 4713)

FUNGI

4181. Ballings, Madeleine. **Le Vermicularia herbarum, parasite des Oeillets. [Vermicularia herbarum a parasite of carnation.]** Bull. Soc. Path. Vég. France 9: 288–289. *2 pl.* 1922.—*Vermicularia* killed leaves of *Dianthus caryophyllus* and formed conidia, pseudosclerotia, and a sterile stroma; the similarity of this stroma to that of *Microsticta* is emphasized.—*J. Dufrénoy.*

4182. Bataille, F. **Flore analytique et descriptive des Tuberoidees de l'Europe et de l'Afrique du Nord. [Analytical and descriptive flora of the Tuberoideae of Europe and North Africa.]** Bull. Soc. Mycol. France 37: 155–207. 1921.—The author presents descriptive keys and bibliographical notes regarding the Tuberoideae of Europe and North Africa. No new names are introduced.—*C. W. Dodge.*

4183. Bezssonoff, N. **Über die Züchtung von Pilzen auf hochkonzentrierten rohrzuckerhaltigen Nährböden und über die Chondriomfrage. [The growth of fungi on media containing a high concentration of cane sugar and a consideration of the chondriome question.]** Ber. Deutsch. Bot. Ges. 37: 136–148. *Pl. 1.* 1919.—The development of the sexual stage in molds is stimulated by the presence of large quantities of cane sugar in the substratum. Under such conditions the chondriome material becomes more or less dispersed throughout the cytoplasm of the cell. The chondriome bodies disappear and the cytoplasm stains darker with nuclear stains.—*D. S. Welch.*

4184. Bisby, G. R. **The literature on the classification of the Hysteriales.** Trans. British Mycol. Soc. 8: 176–189. 1923.—There has always been a great deal of confusion in the classification and naming of the Hysteriales, the indication being that they form a transitional group between the Pyrenomycetes and Discomycetes. Attention is called to the need for further comparative and synthetic study in this group. The review of the literature is followed by a bibliography of 78 titles.—*W. B. McDougall.*

4185. Blumer, Samuel. **Beiträge zur Specialization der Erysiphe horridula Lév. auf Boraginaceen. [Specialization of Erysiphe horridula on Boraginaceae.]** Jahrb. Phil. Fakultät II. Univ. Bern 2: 28–34. 1922. [See Bot. Absts. 12, Entry 588.]

4186. Brooks, F. T., and C. G. Hansford. **Mould growths upon cold store meat.** Trans. British Mycol. Soc. 8: 113–142. *Fig. 1–10.* 1923.—Twelve distinct species of fungi, representing 7 genera, were found growing upon cold store meat. Two of these, *Sporotrichum carnis* and *Torula botryoides*, are described as new, and 1, Wardomyces *anomala*, is described as the type species of a new genus. Numerous species of *Cladosporium* are believed to be strains of *C. herbarum*, the fungus which causes the common "black spot" of meat. Some strains of *C. herbarum* develop from spores and make a considerable growth at −6°C. Some of the other molds develop slightly at this temperature and all grow readily at 0°C. or just above. It is further shown that the spores and young mycelia of some of these molds may retain vitality for more than 2 years at −6°C. The growth of all of these fungi is superficial, the mycelium penetrating not more than 4 mm. at most and the meat is not rendered unfit for food. Growth may be prevented "by controlling the temperature and humidity conditions in cold stores and by avoiding unduly prolonged storage."—*W. B. McDougall.*

4187. Burnham, Stewart H., and Roy A. Latham. **The flora of the Town of Southold, Long Island, and Gardiner's Island, New York. (Third supplementary list.)** Torreya **23**: 3–9. 1923.—The list includes 3 species of gall-producing insects, 3 of Myxomycetes, 9 of Euphyceae, 1 of Phycomycetes, 17 of Pyrenomycetes, 8 of other Ascomycetes, 3 of Melanconiales, 17 of Sphaeropsidales, 1 of Ustilaginaceae, 8 of Pucciniaceae, 1 of Tremellaceae, 1 of Dacromycetaceae, 2 of Thelephoraceae, and 1 of Hydnaceae, with notes on habitat and distribution.—*J. C. Nelson.*

4188. Chapman, A. C. **The use of the microscope in the brewing industry.** Jour. Roy. Microsc. Soc. London **1922**: 261–263. 1922.—The microscope may be used in the study of types of yeast, in preparing pure line cultures, and in ascertaining freedom from bacterial infections.—*Wm. Randolph Taylor.*

4189. Chenantais, J. E. **Notice taxonomique sur le groupe Melanomma.** [Taxonomic note on the group Melanomma.] Bull. Trimest. Soc. Mycol. France **38**: 88–92. 1922.—In classifying the species of this group external or anatomical characters are of little value as are also biological characters. It is suggested that the only method applicable to such a group is, as already suggested by the author for the classification of *Lophiotrema*, the selection of a few important and well recognized forms, the arrangement of these in a series according to spore measurements, and the interpolation of all other forms into this series, considering the latter as synonyms.—*D. S. Welch.*

4190. Colley, Reginald H., and Minnie W. Taylor. **Studies on the aecial stage of Cronartium ribicola and Cronartium occidentale.** [Abstract.] Phytopathology **13**: 46–47. 1923.

4191. Corbière, L. **Note sur le Boletus sphaerocephalus Barla.** [On Boletus sphaerocephalus.] Bull. Trimest. Soc. Mycol. France **38**: 71–77. *Pl. 1 (col.).* 1922.—The author has collected a fungus near Cherbourg which corresponds very closely to the description of the rare species *B. sphaerocephalus* Barla, never reported since its description in 1859. The fungus is redescribed.—*D. S. Welch.*

4192. Cunningham, G. H. **Occurrence of apothecia of brown rot in New Zealand.** New Zealand Jour. Agric. **25**: 177. 1922.—The finding of apothecia of *Sclerotinia cinerea* is recorded. —*N. J. Giddings.*

4193. Davis, W. H. **Germination of the spores of timothy smut (Ustilago striaeformis (Westd.) Niessel).** [Abstract.] Phytopathology **13**: 38–39. 1923.

4194. Dickson, F., and W. R. Fisher. **A method of photographing spore discharge from apothecia.** Phytopathology **13**: 30–32. *Fig. 1–2.* 1923.—A detailed description is given of the method used in securing an excellent photograph of spore discharge from the apothecia of *Sclerotinia libertiana* Fckl.—*B. B. Higgins.*

4195. Dodge, B. O. **The distribution of the orange rust of Rubus.** Phytopathology **13**: 61–74. 1923.—Collections of the orange leaf rust on species of *Rubus* were made throughout the Eastern U. S. A. from North Carolina to Maine. The rust in each collection was determined by germinating the aeciospores. Both *Kunkelia nitens* (Schw.) Arthur and *Gymnoconia interstitialis* (Schl.) Lagh. were found on blackberries and dewberries throughout the territory covered. Only *Gymnoconia* was found on the black raspberry (*Rubus occidentalis*).—*B. B. Higgins.*

4196. Dosdoll, Louise, and J. J. Christensen. **Variations in the length of spores of Helminthosporium sativum P. K. & B. under different conditions of growth.** [Abstract.] Phytopathology **13**: 50. 1923.

4197. Elliott, John A. **The ascigerous stage of the sweet potato black-rot fungus.** [Abstract.] Phytopathology **13:** 56. 1923.—On the basis of morphological characters the fungus known as *Sphaeronema fimbriatum* (E. & H.) Sacc. is transferred to the Ascomycetes under the name *Ceratostomella fimbriata* comb. nov.—*B. B. Higgins.*

4198. Fitzpatrick, H. M. **A survey of the evidence indicating that Phytophthora should be merged with Pythium.** [Abstract.] Phytopathology **13:** 34. 1923.

4199. Fitzpatrick, Harry Morton. Monograph of the Nitschkieae. Mycologia **15:** 23–67. *Pl. 1–7.* 1923.—A revision of the species of *Nitschkia* and of several other genera hitherto not regarded as closely related to it or to each other has resulted in the tentative erection in the Sphaeriales of a new subfamily, **Nitschkieae.** The genera included, *Nitschkia*, **Calyculosphaeria** nom. nov. (Winterella Berl.), *Tympanopsis*, *Thaxteria* and *Acanthonitschkea*, agree strikingly in the external aspect of the perithecium, which is turbinate collapsing to cupulate. Superficial, brown, thick-walled hyphae characterized by a striking metallic iridescence are usually prominent. A stroma is absent in some forms and present in others. Of the 32 species previously included in *Nitschkia* (*Coelosphaeria*) only 3 are retained, a new species, *N. floridana*, being described. Thirteen species are definitely excluded from the whole subfamily, 9 are transferred to the related genera here treated, and 7 remain as doubtful due to unavailability of authentic material. The new name Calyculosphaeria is used to replace *Winterella* Berl. and *Winterina* Sacc., both of which are preoccupied. The species *Nitschkia calyculus*, *N. collapsa*, *N. pezizoidea*, *N. tristis*, and *N. Winteriana* are included in Calyculosphaeria on the basis of their uniseptate spores, and *C. macrospora* is described as new. The writer follows Starbäck in recognizing *Tympanopsis* for *Nitschkia euomphala*, and describes *Tympanopsis uniseriata* as new. The spores of *Thaxteria* are shown to be brown and transversely tri-septate. The species *T. didyma* and *T. leptosporoides* (Wint.) comb. nov. are included, the latter being the same as *Nitschkia rugulosa* and *Coelosphaeria leptosporoides*. In *Acanthonitschkea*, *A. macrobarbata* is described as new.—*H. M. Fitzpatrick.*

4200. Gassner, Gustav. **Ueber einen eigenartigen Uromyces auf Passiflora foetida L.** [A peculiar Uromyces on Passiflora foetida.] Ber. Deutsch. Bot. Ges. **40:** 64–69. *Fig. 1–3.* 1922.—*Uromyces Appelianus* n. sp. is described, and reported as forming galls on *Passiflora foetida* in Uruguay and Brazil.—*W. C. Muenscher.*

4201. Gäumann, Ernst. Ein kleiner Beitrag zur Pilzflora des Krakatau. [A small contribution to the fungus flora of Krakatau.] Bull. Jard. Bot. Buitenzorg **III, 2:** 8–9. *Pl. 1.* 1920.—Two new fungi are described and figured: *Macrophoma Arundinae* on *Arundina speciosa* Bl., and *Phyllosticta Tinisporae* on *Tinispora crispa* Diels.—*Alfred Rehder.*

4202. Gäumann, Ernst. **Ueber Coelographium aurantiacum, n. g., n. sp.** [On Coelographium aurantiacum.] Bull. Jard. Bot. Buitenzorg **III, 2:** 10–14. *Pl. 2, 3.* 1920.—Saccardo's section Coelographium of *Graphium* is elevated to generic rank with 2 species, *C. caviceps* (Oudem.) and *C. aurantiacum*.—*Alfred Rehder.*

4203. Höhnel F. von. **Fünfte vorläufige Mitteilung mycologischer Ergebnisse (Nr. 399–500).** [Fifth preliminary report on mycological investigations.] Ber. Deutsch. Bot. Ges. **37:** 153–161. 1919.—The list includes many genera and species with changes and corrections The names of the following genera appear: *Hymenula, Psilonia, Leptothyrium, Actinopelte, Sirodochiella, Anomomyces, Sphaeria, Epiclinium, Fusoma, Entylomella, Tuburcina, Phaeostilbella, Graphium, Sporocybe, Stromatostysanus, Stysanus, Phyllosticta, Napicladium, Fusicladium, Clasterosporium, Brachydesmium, Hadrotrichum, Coniothecium, Stigmopsis, Helminthosporium, Brachysporium, Oidium, Penicillium, Monilia, Amblyosporium, Acrothecium, Pleurothecium, Scolicotrichum, Passalora, Carlia, Azosma, Macrosporium, Heterosporium, Cordana, Cladosporium, Phragmitis, Pucciniopsis, Cyclogonium, Cladotrichum, Sarcinella, Cercospora, Ramularia, Physospora, Coniophora, Triposporium, Stigmatea, Venturia, Cerato-*

sporella, Fusicladiella, Cercosporidium, Didymothamnium, Hormocladium, Stictochorella, Xyloma, Ascospora, Dothidea, Cheiropodium, Clasterisporium, Meliola, Bactrodesmium, Hymenopodium, Phanerocoryneum, Apotemnoum, Pestalozzina, Mastigosporium, Monothecium, Columnothyrium, Actinothyrium, Melampsora, Melanobasidium, Epochnium, Sporidermium, Phanerocorynella, Coccodinium, Sporidesmium, Thyrostroma, Thyrostromella, Stigmina, Puccinia, Stictochorella, Hemileia, Pseudopuccinia, Circinotrichum, Helicotrichum, Gyrothrix, Campsotrichum, Tricholeconium, Sarcopodium, Conoplea, Botryotrichum, Ceratocladium, Ellisiella, Colletotrichum, Vermicularia, Steirochaete, Pestalozzia, Bartalinia Sphaeropsis, Strasseria, Phoma, Phomopsis, Diaporthe, Cytospora, Dilophospora, Robillarda, Marsonia, Kabatia, Neottiospora, Hysteropezizella, Hysterostegiella, Tiarosporella, Ciliochora, Plagiorhabdus, Sirosperma, Aposphaeria, Pyrenochaeta, Trichocicinnus, Chaetophoma, Desmopatella, Heterosphaeria, Dacryomyces, Ephelis, Balansia, Rhabdospora, Zythia, Pyrenopeziza, Scleroderris, Sclerochaetella, Septoria, Darluca, Botryella, Diplodothiorella, Ceuthospora, Pestalozziella, Chaetospermum, Amphiciliella, Dendrodochium, Calostilbella, Calostilbe, Microcera, Corallomyces, Haplographium, Trematosphaeria, Odontotrema, Phragmonaevia, Naeviella, Pragmopara, Gelatinosporium, Cladsterigma, Micropera.—D. S. Welch.

4204. Höhnel, F. von. **Ueber Bau, Stellung und Nebenfrüchte von Lasiobotrys. [Morphology, systematic position, and imperfect stages of Lasiobotrys.]** Ber. Deutsch. Bot. Ges. **37**: 103–107. 1919.—The genus *Lasiobotrys* Kunze is placed near *Trabutia* under the Dothideales. The genus is described and its morphology and relationship discussed. *Lasiobotrys Lonicerae* Kunze is provisionally broken up as follows (conidial stages in brackets): 1. *Lasiobotrys Lonicerae* Kunze [*Colletotrichella Xylostei* (Faut.) n. comb., syn. *Labrella Xylostei* Faut.]; 2. *L. Periclymeni* n. sp. [*Colletotrichella Periclymeni* (D.) v. H.]; 3. *L. latemarensis* n. sp. [*Kabatia Lonicerae* [Harkness) v. H., syn. *K. latemarensis* Bub.]; 4. *L. mirabilis* n. sp. [*Kabatia mirabilis* B.].—A more complete description of these species is not possible until mature ascospores are found.—*W. C. Muenscher.*

4205. Johann, Helen. **Influence of temperature on the morphology of Fusarium spores.** [Abstract.] Phytopathology **13**: 51. 1923.

4206. Jorgenson, C. A. **Heleococcum aurantiacum n. gen. et n. spec.** Bot. Tidsskr. **37**: 417–420. *Fig. 1–2.* 1922.—The author gives a taxonomic description of the fungus to substantiate his conclusion that it represents a new genus as well as a new species.—*A. L. Bakke.*

4207. Killermann, S. **Neuer Fund einer Vibrissea in Deutschland. [A Vibrissea new to Germany.]** Ber. Deutsch. Bot. Ges. **39**: 345–347. *Fig. 1.* 1921.—*Vibrissea turbinata* Phill. is reported from Germany apparently for the 1st time.—*W. C. Muenscher.*

4208. Kirby, R. S. **Heterothallism in Ophiobolus cariceti.** [Abstract.] Phytopathology **13**: 35. 1923.

4209. Klebahn, H. **Wirtswechsel und Spezialisierung des Stachelbeerrostes. [Specialization and change of host in Ribes rusts.]** Ber. Deutsch. Bot. Ges. **40**: 104–111. 1922.—Infection experiments, with teleutospores of *Puccinia Caricis* produced on *Carex* spp. with aeciospores from *Ribes grossularia,* resulted in abundant infections on *Ribes* but not a single infection on *Urtica dioica.* The author maintains that the 2 rusts forming aecia upon *Ribes* and *Urtica* respectively, are biologically distinct and that Eriksson has not removed the possibility of a mixture of these 2 forms when he secured infections on both *Ribes* and *Urtica* from teleutospores collected on *Carex* growing in the vicinity of both *Ribes* and *Urtica* plants. Experiments indicate that both rusts are specialized on certain sections of the genus *Carex.* The Ribes rust has become more or less specialized upon *R. grossularia* and *R. nigrum.*—*W. C. Muenscher.*

4210. Laibach, F. **Zur Kenntnis der Gattung Septoria. [Concerning the genus Septoria.]** Ber. Deutsch. Bot. Ges. **37**: 245–249. 1919.—The author discusses the relationship between

Septoria and *Mycosphaerella*, and shows that some species of the latter may have an imperfect stage which is more like *Cercospora*. Biological specialization appears to exist in the genus *Septoria*.—*D. S. Welch.*

4211. Mains, E. B. **Observations concerning Puccinia Pattersoniana and Puccinia Moreniana.** Proc. Indiana Acad. Sci. 1921: 133–135. *Pl. 1, fig. A-B.* 1922.—The pedicels of the teliospores of both species stain dark blue with chloral hydrate and iodine. It is thought that *Puccinia Pattersoniana* has its aecial stage on *Brodiaea*.—*F. C. Anderson.*

4212. Mains, E. B., and H. S. Jackson. **Aecial stages of the leaf rust of barley, Puccinia simplex, and rye, P. dispersa, in the United States.** [Abstract.] Phytopathology 13: 49–50. 1923.

4213. Mains, E. B., and H. S. Jackson. **Strains of the leaf rust of wheat, Puccinia triticina, in the United States.** [Abstract.] Phytopathology 13: 36. 1923.

4214. Maire, René, et E. Chemin. **Un nouveau Pyrénomycète marin.** [A new marine pyrenomycete.] Compt. Rend. Acad. Sci. Paris 175: 319–321. *Fig. 1–4.* 1922.—This parasite on the red alga *Dilsea edulis* is described and given the name *Mycaureola Dilseae*.—*C. H. Farr.*

4215. Maublanc, A. **Les champignons comestibles et vénéneux.** [Edible and poisonous fungi.] Encyclopedie Pratique du Naturaliste Vol. VIII. *110 p., 96 col. pl., 140 fig.* P. Lechevalier: Paris, 1921.—This is a handbook to the more common mushrooms of France. Part I, general information: characteristics of fungi, geographical distribution and influence of climate and soil upon fungous flora; the natural habitat of fungi and the time of their appearance. Part II, classification of fungi: a brief characterization of Myxomycetes and Phycomycetes is followed by a more detailed account of the morphology and taxonomy of the Basidiomycetes and a somewhat less thorough treatment of the Ascomycetes. Keys to the important families and genera are given. Part III, edible and poisonous mushrooms: general characteristics of poisonous forms, a list of the deadly and more dangerous species, symptoms of poisoning and treatment; edible forms in general, nutritive values, sale, and preparation for food; culture and preserving of mushrooms. These introductory pages are followed by 96 full page colored plates, each accompanied by a description of the characters, habit, variations, properties, and distinguishing features of each species.—*D. S. Welch.*

4216. Melin, Elias. **Boletus-Arten als Mykorrhizenpilze der Waldbäume.** [Boletus mycorrhizas of forest trees.] Ber. Deutsch. Bot. Ges. 40: 94–97. 1922.—The author previously isolated 3 mycorrhizal fungi from *Pinus sylvestris* and *Picea Abies*. Since these fungi did not fruit in pure culture he compared their hyphae with those of Boletus species which produce mycorrhizas in these trees; they did not prove to be the same. In infection experiments the author was able to produce synthetic mycorrhizas of *Boletus elegans* on *Larix europaea* and *Boletus luteus* on *Pinus sylvestris* and *Picea Abies*.—*W. C. Muenscher.*

4217. Milbraith, D. G. **Alternaria from California.** Bot. Gaz. 74: 320–324. *Fig. 1–2.* 1922.—A new species, *A. oleracea*, is described. It occurs on cabbage, on the leaves of which it causes dark spots lacking the profuse growth of conidia and the zonation characterizing the lesions produced by *A. Brassicae* (Berk.) Sacc. Morphological differences also distinguish the 2 species.—*B. W. Wells.*

4218. Murrill, William A. **Dark-spored agarics—V. Psilocybe.** Mycologia 15: 1–22. 1923.—The genus *Psilocybe* is briefly characterized, a key to 34 species is given, and each species is described. The following new species are presented: *P. caespitosa, P. latispora, P. vialis, P. Cokeri, P. panaeoliformis, P. castaneifolia, P. castaneicolor,* and *P. caerulescens*.—*H. R. Rosen.*

4219. Patouillard, N. Quelques espèces nouvelles de champignons. [New species of fungi.] Bull. Trimest. Soc. Mycol. France 38: 83–87. 1922.—The following species are described as new: *Neopeckia Thaxteri, Calonectria Jimenezii, Platyglaea fibrosa, Tremella granuliformis, Heterochaete ochroleuca, Phacolus iobaphus, Phellinus chaetoloma, Cladoderris imbricata, Rhodophyllus (Entoloma) caeruleatus.* A new genus *Erispora* is described in the Nectriaceae with *E. parasitica* as the type species.—*D. S. Welch.*

4220. Plantefol, M. Sexualité expérimentale des Basidiomycetes. [Sex in Basidiomycetes.] Ann. Sci. Nat. Bot. 3: xxxii-xli. *Fig. 1, 2.* 1921.—A review is given of the work of Mlle. Bensaude on certain Agaricaceae. A parallelism is shown to exist between the binucleate condition of certain cells here and that known in the Uredinales. It is pointed out that this probably indicates a kind of sexuality.—*Paul Weatherwax.*

4221. Pillay, T. Padmanabha. Zur Entwicklungsgeschichte von Sphaerobolus stellatus Tode. [The development of Sphaerobolus stellatus Tode.] Diss. Jahrb. Phil. Fakultät II Univ. Bern. 3: 197–219. *Fig. 1–4.* 1923.—The reduction division takes place in the basidium and the germ tube from the spore immediately begins to form clamp-connections so that the plant is diploid from the start. There is no primary haploid mycelium since the diploid stage begins with the spore, in which paired nuclei are found. It is not shown how this dikaryon originates but the possibilities are discussed. Information regarding Gastromycetes other than *Hypochnus terrestris* is meager. The haploid phase is more developed in *Cyathus* than in *Sphaerobolus,* which was early placed in the Gastromycetes. According to the present investigations it probably is to be included in the Plectobasidieae as established by Fischer. It is suggested that together with *Scleroderma, Leucogaster,* and *Melanogaster,* it might be considered intermediate between the Plectobasidieae and the Hymenobasidieae. —*D. S. Welch.*

4222. Tiegs, E., Beiträge zur Oekologie der Wasserpilze. [Contributions to the ecology of water moulds.] Ber. Deutsch. Bot. Ges. 37: 496–501. 1919.—*Leptomitus* is found in water containing large amounts of organic nitrogen. *Sphaerotilus natans* grows commonly in larger streams containing smaller amounts of organic nitrogen. Both of these forms thrive best in alkaline or neutral waters. In contrast, *Penicillium fluitans* n. sp. is found in waters containing acid waste from munition factories.—*D. S. Welch.*

4223. Van Hook, J. M. Indiana fungi. VI. Proc. Indiana Acad. Sci. 1921: 143–148. 1922.—A list of 34 species with place and date of collection is given. In many cases the descriptions are rewritten or amplified.—*F. C. Anderson.*

4224. Weese, J. Beitrag zur Morphologie und Systematik einiger Auriculariineengattungen. [The morphology and systematic relationships of certain genera of the Auriculariales.] Ber. Deutsch. Bot. Ges. 37: 512–519. 1919.—The following genera of the family Phleogenaceae are discussed: *Stilbum, Pilacrella, Hoehnelomyces,* and *Phleogena,* with a key for their separation.—*D. S. Welch.*

4225. Weese, J. Mykologische und phytopathologische Mitteilungen. [Mycological and phytopathological contributions.] Ber. Deutsch. Bot. Ges. 37: 520–527. 1919.—I. Canker of fruit and shade trees. A review is given of the literature with special reference to those pathogens belonging to the genus *Nectria.* The author previously showed that *N. ditissima* (Tul.) Fr. (= *N. coccinea* (Pers.) Fr.) is not the organism causing the common canker of fruit trees, which is caused by *N. galligena* Bres., a form often incorrectly determined.—II. A disease of orchids. *Nectria bulbicola,* described by P. Hennings and said by him to cause severe injury to orchids, is found to be *N. ochroleuca* (Schw.) Berk., a form which is to the tropics what *N. cinnabarina* is to Central Europe. *N. Orchidearum* Theissen also falls into this species. To control the disease all affected bulbs and roots should be removed.—*D. S. Welch.*

4226. Weston, William H., Jr. **Production and dispersal of conidia in the Philippine Sclerosporas of maize.** Jour. Agric. Res. **23**: 239–278. *Pl. 1–10.* 1923.—In their conidial phases *Sclerospora philippinensis* Weston and *S. spontanea* Weston are injurious parasites of maize in the Philippine Islands. Production of conidia on infected plants is preceded by the establishing on leaves and sheaths of characteristically discolored areas. Conidiophores develop only from the stomata, at night, and when the surface is covered with dew or other moisture. Several are formed at each stoma during the course of the night. Evidence is presented that the conidia are liberated by active ejection from the sterigmata, rather than by passive disjunction, although the writer considers that further investigation is necessary to establish this point. Nocturnal development of conidiophores in the usual amount of dew follows a relatively regular cycle, which, however, may be altered by rain or by drying winds. Conidia are produced in vast numbers and production may be repeated on successive nights when conditions are favorable over a period covering as much as 75 per cent of the total life of the host plant. Dispersal of conidia takes place necessarily at night and is accomplished chiefly by the wind. Splashing, acting either separately or with the wind, and, to a less degree, such agents as surface water, insects, and moist soil laden with conidia are other factors in dispersal. Dissemination of the 2 downy mildews on maize is accomplished in the Philippine Islands by means of the conidia. With reference to the possible entry into the U. S. A. or other countries, the author points out that mycelium in the case of maize itself plays no part in distribution. However, as mycelium in cuttings of other hosts, such as sugar cane and related grasses, these diseases could be carried long distances. The oospore stage is not found on maize in the Philippines. Whether the oogonial Sclerosporas occurring on sugar cane and 2 wild grasses in the Islands are related to maize is not known. This stage must be responsible for at least some of the local and distant spread of these fungi and may possibly be involved also in the dissemination of the conidial phases on maize.—*L. M. Massey.*

4227. Weston, William H., Jr. **The production of conidia at night in species of Sclerospora.** [Abstract.] Phytopathology **13**: 34. 1923.

4228. Wineland, Grace O. **The production in culture of the ascigerous stage of Fusarium moniliforme.** [Abstract.] Phytopathology **13**: 51. 1923.

LICHENS

4229. Bioret, George. **Les Graphidées corticoles.** [The bark-inhabiting Graphidaceae. Ann. Sci. Nat. Bot. **4**: 1–68. *Pl. 1–11.* 1922.—An anatomical and biological description is given of the crustaceous, bark-inhabiting lichens of the Graphidaceae. Much variation in the structure of the thallus is shown in different genera and in different species of the same genus. The development of the thallus is much influenced by the nature of the substratum. Many varieties and some species that have been described are shown to be merely variations due to the state of maturity of the thallus or to the nature of the substratum. No new names are proposed.—*Paul Weatherwax.*

4230. Giardini, Giovanni I. **A preliminary report on the lichens of western Pennsylvania.** Bryologist **25**: 100–108. 1922.—A list is given of 82 species and varieties of lichens. There is no descriptive matter, but each species listed is accompanied by full notes on locality and habitat, with indication of relative abundance.—*E. B. Chamberlain.*

4231. Lynge, Bernt. **Index specierum et varietatum lichenum quae collectionibus "Lichenes Exsiccati" distributae sunt.** [Index of species and varieties of lichens which have been distributed as "Lichenes Exsiccati."] Nyt Mag. (Appendix) **53–60**: (in 2 parts, each with separate paging) Part I. *pp. 1–559;* Part II. *pp. 1–316.* 1915–1922.—The 1st part contains complete details as to bibliography and contents of 119 different issues of exsiccati containing lichens.—In the 2nd part alphabetical lists are given of every species, variety, and named form in all the issues with citations of serial numbers and issues. Identifications of the different species are not made and synonymies are not given.—*K. Münster Ström.*

4232. Moreau, Fernand. **Recherches sur les lichens de la famille Stictacées. [Lichens of the family Stictaceae.]** Ann. Sci. Nat. Bot. 3: 297–376. *Pl. 1–4, fig. 1–20.* 1921.—The Stictaceae are here treated in the same manner as were the Peltigeraceae in a previous article by the same author in collaboration with Mme. Moreau [see Bot. Absts. 4, Entry 1130]. The problems investigated are: the development of the apothecium, a comparison of the elements of the lichen with corresponding algae and fungi, and the phenomenon of biomorphogenesis. The great uniformity noted in the 11 species studied would justify inclusion in 1 large genus. The algae concerned have the character of Chlorophyceae or of Nostocaceae. The formation of the apothecium and the soredium is described. Fecundation was not observed in any instance. Many apothecia are aborted in primordial stages, this doubtless explaining the sterility of many Stictaceae. A theoretical discussion is given of the relation of the parts of a lichen and the significance of the symbiotic condition.—*Paul Weatherwax.*

4233. Tobler, Friederich. **Biologische Flechtenstudien I. [Biological studies of lichens. I.]** Ber. Deutsch. Bot. Ges. 37: 364–368. *Fig. 1–8.* 1919.—The soredia of *Cetraria glauca* L. "germinate" on twigs of *Fagus* and *Pinus Picea*, producing distinct thalli which soon fuse into larger matted thalli with irregular margins.—*W. C. Muenscher.*

BACTERIA

4234. Cholodnyj, N. **Ueber Eisenbakterien und ihre Beziehungen zu den Algen. [Iron bacteria and their relation to algae.]** Ber. Deutsch. Bot. Ges. 40: 326–346. *Fig. 1–6.* 1922.—Algal filaments especially of *Conferva*, growing in water containing iron often possess tubercles, "Psichohormium-Bildungen." These gelatinous masses are incrusted with iron but do not represent enlargements of cell membranes. The tubercles are caused by Sideromonas *Confervarum* n. g., n. sp., a short cocco-bacillus, the cells of which tend to form chains. The presence of many of these chains explains the characteristic spongy structure of the tubercles. The tubercles often produce a hypertrophy of the chlorophyll apparatus in the enclosed cells, which have a dark green color and store quantities of reserve food. These "modified cells" apparently represent a resting stage of the alga. The formation of these modified cells suggests a symbiotic relationship between *Sideromonas* and *Conferva*, in which the iron bacteria probably obtain oxygen from the assimilating algal cells.—*W. C. Muenscher.*

4235. Kitchen, J. **A key for the identification of bacteria.** Jour. Roy. Microsc. Soc. London 1921: 378–380. 1921.—An index number system is given, suggested as more easily memorized than that used by the Society of American Bacteriologists.—*Wm. Randolph Taylor.*

4236. Lisk, Henrietta. **Gas production by an aerobic spore bearing bacillus.** Jour. Amer. Water Works Assoc. 10: 139–144. 1923.—The writer has found an organism in milk which shows morphological and physiological characteristics corresponding to those described for *B. asterosporous*. The conclusion is reached that all aerobic, spore bearing, gas producing bacilli so far described are probably this species.—*D. S. Welch.*

4237. Mutch, N. **The isolation of the single bacterial cell.** Jour. Roy. Microsc. Soc. London 1919: 221–224. *Fig. a.* 1919.—Hanging drops of a suspension of the organisms are examined in a moist slide provided with a ring of filter paper wet with salt solution. These drops are prepared by a series of dilutions. When a drop with but 1 organism has been obtained additional sterile nutrient is added and the slide set aside to allow the organism to increase enough to permit bulk transfers.—*Wm. Randolph Taylor.*

4238. Norton, John F., and Gordon E. Davis. **Bacteriostatic action of dyes on Streptococcus viridans and pneumococci.** Jour. Infect. Diseases 32: 220–222. 1923.—No difference was noted between the action of dyes on the *Streptococcus viridans* and on the pneumococcus groups. The bacteriostatic action was marked only where the dyes contained 3 benzol rings and 2 or more amino groups containing alkyl radicals.—*R. L. Starkey.*

4239. Potthoff, Heinz. **Zur Frage nach dem Vorkommen von Befruchtungsvorgängen bei Bacterien. [On the occurrence of fertilization processes in bacteria.]** Naturwissenschaften **10**: 441–446. *Fig. 1–12.* 1922.

4240. Truffaut, Georges, et N. Bezssonoff. **Un nouveau bacille fixateur d'azote. [A new nitrogen-fixing bacterium.]** Compt. Rend. Acad. Sci. Paris **175**: 544–546. 1922.—The organism, which is described as *Bacillus Truffauti*, resembles *Bacillus vulgaris* in structure. It fixes as much as 7 mgm. of nitrogen per gm. of levulose consumed, and develops rapidly under anaerobic conditions.—*C. H. Farr.*

4241. Walker, John E. **Variations in Streptococcus hemolyticus on animal passage.** Jour. Infect. Diseases **32**: 287–296. 1923.—The appearance of colonies and the virulence of the "moist" type of *Streptococcus epidemicus* altered with age and acquired the characteristics of *S. hemolyticus*. With animal passage, *S. hemolyticus* showed the reverse tendencies.—*R. L. Starkey.*

PALEOBOTANY AND EVOLUTIONARY HISTORY

Edward. W. Berry, *Editor*

(See also in this issue Entries 3774, 3779, 3818, 3855)

4242. Bertrand, Paul. **Sur les flores houillères de la Sarre. [On the coal flora of the Sarre region.]** Compt. Rend. Acad. Sci. Paris **175**: 770–773. 1922.—The flora is given of 4 or 5 zones, which are named after the characteristic species, as follows: Zone of *Pecopteris lamurensis*, zone of *Mixoneura ovata*, zone of *Pecopteridium Defrancei*, zone of *Neuropteris tenuifolia*. The last-named is said to correspond to the zone of *Neuropteris tenuifolia* and *Linopteris sub-Brongiarti* of northern France, where the 3rd zone given above is not represented. The 2nd zone corresponds exactly to that of *Mixoneura flexuosa* of the Gard region. The 1st zone, which constitutes the lower beds of the Ottweiler, represents the series of Rive-de-Gier in the lower series of the Molieres of the Gard region.—*C. H. Farr.*

4243. Booth, A. L. **The microstructure of coal from an industrial standpoint.** Jour. Roy. Microsc. Soc. London **1922**: 151–160. *Pl. 6, 7.* 1922.

4244. Carpentier, A. **Revue des travaux de paléontologie végétale publiés dans le cours des années 1910–1919. Premier partie: Paléozoïque. Suite. [Review of the work in plant paleontology published in the course of the years 1910–1919. First part: Paleozoic. Continued.]** Rev. Gén. Bot. **35**: 42–47, 101–112, 149–160. 1923.

4245. Depape, Georges. **Recherches sur la flore pliocène de la vallée du Rhône.—Flores de Saint-Marcel (Ardèche) et des environs de Théziers (Gard). [Pliocene flora of the valley of the Rhone.]** Ann. Sci. Nat. Bot. **4**: 73–265. *Pl. 1–15, Fig. 1–45.* 1922.—This is a monographic account of the Pliocene floras from Saint Marcel, Théziers, Bagnols and Eurre in the western valley of the Rhone, of upper Plaisanician age, and of Vacquières of lower Astian age. There is a good bibliography, the Pliocene geology is discussed, and the species are elaborately described and illustrated. The total flora numbers 72 for the most part well known species, only 1, *Polygonatum pliocenicum*, being described as new. The following genera are represented: *Woodwardia, Osmunda, Ginkgo, Torreya, Glyptostrobus, Sequoia, Cupressus, Pinus, Phragmites, Sabal, Smilax, Salix, Populus, Alnus, Carpinus, Fagus, Quercus, Castanea, Juglans, Pterocarya, Carya, Myrica, Ulmus, Zelkova, Buxus, Liriodendron, Laurus, Persea, Oreodaphne, Sassafras, Cinnamomum, Buettneria, Zanthoxylon, Pirus, Robinia, Acer, Sapindus, Celastrus, Ilex, Berchemia, Cornus, Liquidambar, Platanus, Trapa, Diospyros, Viburnum, Notelea, Fraxinus, Phillyrea, Nerium,* and *Coriaria.* The most varied genera are *Quercus, Populus, Acer,* and *Viburnum.* Thirty-one are identical with, or close to, still living species, 11 have decided North American affinities, 11 are Oriental, 5 are related to forms still living in

the Canary Islands, 28 are Mediterranean, 4 are Caucasian, and 16 are European cool temperate. The ecological bearing is carefully analyzed and the flora is considered to represent elements of the littoral, stream valleys, hills, and uplands of 1000 m. or more. The precipitation is considered to have been variable for these different zones, though ample. The mean annual temperature is considered to have been about 20°C. The fossils are carefully compared with both recent and fossil floras.—*E. W. Berry.*

4246. Douin, R. **Les mousses et les hépatiques fossiles des tufs du Lautaret (Hautes Alpes).** [The fossil mosses and liverworts of the tufa of the Lautaret (High-Alps).] Rev. Gén. Bot. **35:** 113–126. *Pl. 1–2.* 1923.—The earlier work on the fossil liverworts and mosses is briefly reviewed. The age and origin of the tufa of Lautaret is discussed and the flora of this region briefly mentioned. The author determined 5 mosses of the family Hypnaceae and 5 liverworts, all, apparently, belonging to the acrogynous Jungermanniaceae. The mosses were *Amblystegium riparium* Br., *Hypnum commutatum* Hedw., *H. irrigatum* Zett., *H. falcatum* Brid., *Eurynchium circinnatum* B. E., var., *deflexifolium* Boulay. The liverworts described are: *Lophozia Hornschuchiana* Nees, *Jamesoniella Carringtoni* (Balf.) Schiffner var. *alpina* R. Douin, *Pedinophyllum interruptum* (Nees) Schiffner, *Plagiochila asplenioides* L., and *Aplozia riparia* (Tayl.) Dum.—*J. C. Gilman.*

4247. Florin, R. **Zur Alttertiären Flora der südlichen Manschurei.** [The Older Tertiary Flora of Southern Manchuria] Palaeont. Sinica **A1:** 1–52. *Pl. 3. fig. 3.* 1922.—The author describes a considerable flora from the coal measures of Fu-Shun in southern Manchuria the age of which is considered upper Eocene or lower Oligocene. The following genera represented by previously described species are discussed: *Lygodium, Osmunda, Sequoia, Dryophyllum, Fagus, Zelkova* (?), *Panox* (?), *Viburnum, Phyllites, Glyptostrobus, Corylus* (?), *Carpinus, Alnus, Populus.*—*E. W. Berry.*

4248. Knowlton, F. H. **Fossil plants from the Tertiary Lake beds of south-central Colorado.** U. S. Geol. Surv. Professional Paper **131:** 183–197. *Pl. 41–44.* 1923.—The author describes the fossil plants from lake beds in the volcanic series of south-central Colorado which are considered to be upper Miocene in age. The following species are recorded: *Pinus crossii* n. sp., *P. similis* n. sp., *P. coloradensis* n. sp., *P. florissanti* Lesq., *Abies rigida* n. sp., *A. longirostris* n. sp., *Sabina linguafolia* (Lesq.) Ckl., *Populus lesquereuxi* Ckl., *Alnus larseni* n. sp., *Planera myricaefolia* (Lesq.) Ckl., *Rubus inquirendus* n. sp., *Ribes protomelaenum* Ckl., *Vitis florissantella* Ckl., *Odostemon marginata* (Lesq.) Knowlton, *O. hakeaefolia* (Lesq.) Knowlton, *Sterculia aceroides* n.sp., *Phyllites potentilloides* n. sp., and 2 species of Phyllites.—*E. W. Berry.*

4249. Knowlton, F. H. **Revision of the flora of the Green River formation with descriptions of new species.** U. S. Geol. Surv. Professional Paper **131:** 133–182. *Pl. 36–40.* 1923.—This is a revision of this middle Eocene flora. Thirty-six species in the literature are dropped as worthless or from other horizons. *Alnites* and *Alnus* become *Planera; Ampelopsis* becomes *Parthenocissus; Ceanothus* becomes *Zizyphus; Myrica* becomes *Rhus;* and *Pecopteris* becomes *Osmunda.* The recognized Green River flora now consists of 81 species and comprises 3 fungi, 5 ferns, 8 equisetums, 9 monocotyledons including 3 palms, and among the dicotyledons the genera *Salix, Myrica, Comptonia, Juglans, Quercus, Planera, Ficus, Lomatia, Oreodaphne, Pimelia, Brasenia, Sedum, Ailanthus, Amygdalus, Dalbergia, Leguminosites, Sophora, Mimosites, Sapindus, Rhus, Euonymus, Acer, Ilex, Zizyphus, Cissus, Parthenocissus, Eucalyptus, Aralia, Andromeda, Sambucus, Achaenites, Antholithes, Carpolithus, Carpites, Phyllites,* and *Nordenskiolda.*—The following are described as new: *Cacnomyces eucalyptae, C. sapindicola, Danaea coloradensis, Pontederites hesperia, Salix linearis, S. longiacuminata, Myrica minuta, M. praedrymeja, Comptonia* (?) *anomala, Juglans winchesteri, Oreodaphne viridiflumensis, Pimelia spatulata, Sedum hesperium, Dalbergia viridiflumensis, D. retusa, Sophora coloradensis, Mimosites coloradensis, Sapindus winchesteri, Rhus myricoides, Sambucus winchesteri, Achaenites cichoroides, Carpolithus caryophylloides, Carpites newberryana, C. inquirenda, Phyllites winchesteri, C. coloradensis.*—*E. W. Berry.*

4250. Krausel, R. **Ist Taxodium distichum oder Sequoia sempervirens Characterbaum der deutschen Braunkohle?** [Is Taxodium distichum or Sequoia sempervirens the characteristic tree of the German lignite?] Ber. Deutsch. Bot. Ges. 39: 258–263. *Fig. 1–3.* 1921.—Sections of wood from the lignite deposits of Germany showed numerous resin canals, especially in the wound tissue, which have not been found in *Taxodium distichum* or *T. mexicanum.* The author therefore concludes that the common tree in these lignite deposits is *Taxodioxylon sequoianum* (the Tertiary form of *Sequoia sempervirens*) and not *Taxodioxylon taxodii* (the Tertiary form of *Taxodium distichum* including *T. mexicanum.*) [See also following entry.] —*W. C. Muenscher.*

4251. Kubart, B. **Ist Taxodium distichum oder Sequoia sempervirens Characterbaum der deutschen Braunkohle?** [Is Taxodium distichum or Sequoia sempervirens the characteristic tree of the German lignite?] Ber. Deutsch. Bot. Ges. 39: 26–30. *Fig. 1–2.* 1921.—According to some investigators brown coals or lignites found in Germany are composed largely of the Tertiary form of *Taxodium distichum.* Other investigators state that the plant concerned here is the Tertiary form of *Sequoia sempervirens.* Woods with wood parenchyma cells with thickened and pitted cross walls have been referred to *Taxodioxylon taxodii* (the Tertiary form of *Taxodium distichum*). Woods with thin, non-pitted cross walls in the wood parenchyma cells were referred to *Taxodioxylon sequoianum* (the Tertiary form of *Sequoia sempervirens*). The author points out that the wood in these lignite deposits cannot be referred with certainty to either *Sequoia* or *Taxodium* since *Taxodium mexicanum* has cross walls in the wood parenchyma cells that are more or less similar to those in *Sequoia sempervirens.* [See also preceding entry.]—*W. C. Muenscher.*

4252. Lundqvist, G. **Fossile Pflanzen der Glossopteris Flora aus Brasilien.** [Fossil plants of the Glossopteris flora in Brazil.] K. Svenska Vetens. -Akad. Handl. 60[3]: 1–36. *pl. 1–2.* 1919.—The author describes the following Permian plants from Paraná and Rio Grande do Sul: *Marchantites, Schizoneura* sp., *S. gondwanensis* Feist. (?), *Sigillaria brardi* Brongn., *S.* sp., *Knorria* sp, spores, *Cardiocarpon* sp., *Glossopteris browniana* Brongn. (?), *G. indica* Schimp., *G.* sp., *Gangamopteris obovata* (Carr.) White, *G.* sp., *Neuropteridium plantianum* (Carr.) White, *Noeggerathiopsis hislopi* (Bunb.) Feist., *Arberia* (?) *brasiliensis* n. sp., *Voltzia heterophylla* Brongn. (?), *Annularia australis* Feist., *Sphenophyllum oblongifolium* Unger, *Pecopteris* sp., *Brachyphyllum* (?) *australe* Feist.—*E. W. Berry.*

4253. Maiden, J. H. **A critical revision of the genus Eucalyptus.** Vol. VI, Part 5. *p. 219–254, pl. 224–227.* John Spence: Sydney, 1922.—This part continues the discussion of the topic "Fossil plants attributed to Eucalyptus" and deals particularly with those fossil forms found in countries outside of Australasia. The following species, although previously published, redescribed, and illustrated: *Eucalyptus oceanica* Unger, *E. Haeringiana* Ettingshausen, *E. aegea* Unger, *E. sibirica* Heer, *E. (?) americana* Lesq., *E. borealis* Heer, *E. angusta* Velenovsky, *E. dubia* Ettingshausen, *E. dakotensis* Lesq., *E. Gouldii* Ward, *E. proto-Geinitzi* Saporta, *D. Choffati* Saporta, *E. (?) attenuata* Newberry, *E. (?) angustifolia* Newberry, *E. (?) nervosa* Newberry, *E. (?) parvifolia* Newberry, *E. latifolia* Hollick, *E. Wardiana* Berry, *Myrcia havanensis* Berry, *Myrtophyllum* (*Eucalyptus*?) *Geinitzi* Heer, and *M.* (*Eucalyptus*?) *Schubleri* Heer. A chapter is also added on the "Exudates" of *Eucalyptus.*—*J. M. Greenman.*

4254. Pilger, R. **Die Stämme des Pflanzenreichs.** [The lineage of the plant kingdom.] *2nd ed., 119 p., 23 fig.* Vereinigung Wissenschaftliche Verleger: Berlin and Leipzig, 1921.

4255. Rudolph, Karl. **Zur Kenntnis des Baues der Medullosen.** [The structure of the Medullosa.] Beih. Bot. Centralbl. II Abt., 39: 196–222. *Pl. 3–4.* 1922.—The stem of *Medullosa stellata, M. porosa,* and *M. Leuckarti* is a solenostele (amphiphloic siphonostele). The primary wood of this stem consists of parenchyma with more or less numerous tracheids similar to *Heterangium.*—The outer wood has gaps the arrangement of which has not been determined.—While the tracheids of the stem extend lengthwise as a rule, a cross section of

the primary xylem shows constantly: (1) an inner layer with tracheids extending lengthwise; (2) a middle layer with tangential horizontal tracheids; (3) a small outer layer with tracheids extending lengthwise.—The condition of the middle layer with its horizontal tracheids is compared with the girdle bundles in the cycads. It is suggested that the problem of the horizontal tracheids may be an ecological one.—*L. Pace.*

4256. Sahni, B. **The present position of Indian palaeobotany.** Proc. Asiatic Soc. Bengal 17[4]: *clii-clxxv.* 1921 [1922].—A historical and stratigraphic account is given of the present status of the study of the fossil floras of India from the Cambrian to the post-Tertiary. It is especially important in connection with the more abundant floras of the Gondwana series, giving lists of species with their horizons for the Carboniferous, Permian, Triassic, Jurassic, and Cretaceous, with a bibliography.—*E. W. Berry.*

4257. Walkom, A. B. **Paleozoic floras of Queensland. Part 1. The flora of the Lower and Upper Bowen Series.** Queensland Geol. Surv. Publ. 270. *64 p., 9 pl.* 1922.—A monographic account is given of 23 different plants, members of the Glossopteris flora, that comprise the flora of the Bowen series. *Glossopteris jonesi* and *Samaropsis etheridgei* are described as new, and the following are recorded from Queensland for the 1st time: *Phyllotheca robusta, Glossopteris tortuosa, Gangamopteris cyclopteroides, G. angustifolia,* and *Dictyopteridium sporiferum.* Scale fronds of *G. lossopteris* are described and seed associated with this genus and described as *Nummulosperum bowenense* are considered as its probable fruits. The Bowen series is of Permian, or Permo-Carboniferous, age.—*E. W. Berry.*

PATHOLOGY

Frederick V. Rand, *Editor*
Lillian C. Cash, *Assistant Editor*

(See also in this issue Entries 3650, 3651, 3661, 3699, 3703, 3712, 3716, 3718, 3719, 3751, 3773, 3779, 3782, 3793, 3800, 3904, 3931, 3933, 3937, 3953, 3977, 3979, 4003, 4005, 4012, 4029, 4032, 4043, 4047, 4053, 4055, 4056, 4073, 4074, 4080, 4102, 4119, 4134, 4136, 4138, 4148, 4149, 4181, 4183, 4190, 4192, 4193, 4194, 4195, 4196, 4197, 4198, 4200, 4201, 4205, 4208, 4209, 4210, 4212, 4213, 4216, 4217, 4225, 4226, 4227, 4228, 4234, 4454, 4473, 4491, 4503, 4560, 4583, 4592, 4594, 4597, 4713, 4715, 4717.)

DISEASES CAUSED BY FUNGI

4258. Anonymous. **Kaalbrok. [Clubroot.]** Tidsskr. Planteavl. 28: 563–566. 1922.—This is a discussion of the effects of clubroot (*Plasmodiophora Brassicae*) on the roots of crucifers.—*Albert A. Hansen.*

4259. Alcock, M. L. **A die-back in Sussex.** Trans. British Mycol. Soc. 8: 190. 1923. —*Diplodia Griffoni* Sacc. & Trav. was found to be the cause of a bark disease of apple trees in Sussex.—*W. B. McDougall.*

4260. Allen, Ruth F. **A cytological study of infection of Baart and Kanred wheats by Puccinia graminis tritici.** Jour. Agric. Res. 23: 131–151. *pl. 1–6.* 1923.—The variety Baart is susceptible to the strain (I) of the fungus used while Kanred is immune. Germination of urediniospores and the formation of substomatal vesicles is the same on both hosts. In Kanred, however, the number of entrances is small, apparently due in part to the smallness of the stomatal opening. In Baart, a slender hypha issuing from the vessicle proceeds until it comes in direct contact with a cell. It then swells at the tip, its pair of nuclei divide, a septum is formed and the terminal cell which is closely applied to the host cell becomes the haustorium mother cell. From the mother cell, penetration of the cell wall of the host is effected through an invisible pore. The plasma membrane of the host cell is invaginated by the enlarging haustorium. A new growing point arises from the pe-

nultimate cell of the hypha and other haustorial mother cells may be produced in the substomatal vesicle or in intercellular spaces. The process is the same in Kanred until a haustorium is formed. Penetration of the host cell is actually accomplished but the haustorium soon shrinks and dies and the effect is communicated to the mother cell or even farther. The host cell likewise dies but diffusion of material from the dead host cells to healthy ones seems to be prevented by the formation of thickened contact walls. The fungus may produce several infecting hyphae before it is completely exhausted.—The osmotic concentration of the attacked host cell is changed. Various theories of immunity are discussed but the chemical theory seems to correspond best with the facts observed.—*D. Reddick.*

4261. Barsali, E. **Il seccume dei Platani.** [Leaf blight of Platanus.] Processi Verbali Soc. Toscana Sci. Nat. **28:** 6–8. 1919.—The 3 forms of *Gloeosporium* found on leaves and branches of *Platanus* affected with sycamore leaf blight or anthracnose (*Gloeosporium nervisequum* (Fckl.) Sacc., *G. nervisequum* var. *valsoideum* Saac., and *G. Platani* (Mont.) Oud. have been determined to be the same fungus, all 3 being conidial forms of *Gnomonia veneta* (Sacc. & Speg.) Kleb. The slight variations in spore measurements may be attributed to differences in substratum, as verified by artificial cultures.—The disease has spread rapidly in Italy and is particularly prevalent in cold, wet springs. Cultivation of resistant varieties of sycamore is considered the most effective means of control.—*Edith K. Cash.*

4262. Barss, H. P. **Copper carbonate for wheat smut control.** Oregon Agric. Exp. Sta. Circ. 30. *3 p.* 1922.—This article discusses preliminary tests and gives directions for using this dust treatment.—*C. E. Owens.*

4263. Berger. **Ist der Hallimasch Parasit oder Saprophyt?** [Is the "honey fungus" [Armillaria mellea] a parasite or a saprophyte?] Forstwiss. Centralbl. **44:** 424–431. 1922.—Since Hartig's experiments in 1872 it has generally been considered that the fungus is both saprophytic and parasitic, although some have asserted that it attacks only diseased plants. Berger cites observations indicating that the fungus is saprophytic only. In all cases investigated the affected trees were also attacked by bark-beetles, injured by lightning, or otherwise weakened; in no case did the author observe an otherwise healthy tree attacked by *Armillaria mellea.* His theory is that infection must be preceded by fermentation or decomposition of the sap, such as occurs on freshly cut stumps and in trees attacked by bark-beetles or otherwise injured.—*W. N. Sparhawk.*

4264. Birmingham, W. A. **Diseases of Pinus insignis.** Australian Forest. Jour. **5:** 181–182. *1 fig.* 1922.—*Thelephora terrestris,* responsible for what is commonly known as "smothering disease," is very briefly discussed.—*C. F. Korstian.*

4265. Blanchard, M., et G. Lefrou. **Présence dans une lésion humaine d'un saccharomycète pathogène pour le cobaye.** [Presence in a human lesion of a saccharomycete pathogenic to guinea pigs.] Bull. Soc. Path. Exotique **15:** 915–918. 1922.—A saccharomycete was present "to the exclusion of all other germs" in a deep abscess of the scapulo-vertebral region of a European at Brazzaville, French West Africa. Attempts to culture this yeast on several media failed. Pus injected into guinea pigs produced swellings and ulcers in which this yeast was the only organism demonstrable.—*Philip Brierley.*

4266. Branstetter, B. B. **Fungi internal to Missouri seed corn of 1921.** Jour. Amer. Soc. Agron. **14:** 354–357. 1922.—A disease survey shows that 1921 Missouri corn was heavily infected with *Fusarium moniliforme, Cephalosporium Sacchari,* and *Diplodia Zeae* in the order named, that kernels of many ears were infected with 2 of the above fungi, and that with care comparatively disease-free ears can be selected, thus eliminating the necessity of using the germinator as a means of detecting heavy infection.—*F. M. Schertz.*

4267. Brentzel, W. E. **A disease of flax not previously reported in the United States.** [Abstract.] Phytopathology 13: 53–54. 1923.—This disease is probably the same as that produced by *Phlyctaena linicola* Speg. in South America.—*B. B. Higgins.*

4268. Brentzel, W. E. **Disease of flax caused by a species of Rhizoctonia.** [Abstract.] Phytopathology 13: 53. 1923.

4269. Briton-Jones, H. R. **The smuts of millet (Andropogon Sorghum Brot.).** Ministry Agric. Egypt Tech. and Sci. Serv. (Bot. Sec.) Bull. 18. *6 p., 3 pl.* 1922.—The following smuts of millet occurring in Egypt are briefly discussed, including occurrence, descriptions of the disease and causal fungus, and methods of treatment: long smut (*Tolyposporium filiferum* Busse), head smut (*Ustilago reiliana* Kuehn), and grain smut (*Sphacelotheca Sorghi* (Lk.) Clinton).—*Frederick V. Rand.*

4270. Bruijn, Helena L. G. de. **The saprophytic life of Phytophthora in the soil.** Mededeel. Landbouwhoogeschool Wageningen 24[1]: 1–38. *2 pl.* 1922.—Researches into the nature of *Phytophthora Syringae* Klebs brought the author to the same conclusions as reached by Klebahn (1904), who was of the opinion that the fungus persists in the soil. Experiments were also conducted with *P. erythroseptica* Peth. and with *P. infestans* DeBy., bog soil, leaf mold, and other types of soil being used. The soils were put into test tubes just as received from nature, and sterilized. Portions of pure cultures with some of the medium were then transferred to the soil tubes. Soon the mycelium started growth in the surrounding soil, and the latter, containing the fungus, was again transferred to other soil tubes to make sure that the fungi could live on soil alone. All 3 species were found to persist in soil, but the external behavior differed among them. *P. Syringae* forms white aerial mycelium on the top of the soil if the humidity is favorable; if too moist, however, the fungus, though alive, may not be visible. *P. erythroseptica* forms more aerial mycelium, and behaves differently on different types of soil, developing well on clay. *P. infestans* is not easily cultivated, and the growth of the fungus is rather slow. A piece of medium containing the fungus was transferred to a tube with sterilized bog soil whereupon the mycelium soon spread over the surrounding soil. After 4 weeks the transferred piece of agar was taken out of the tube, leaving the mycelium on the soil alone, and later the bog soil with the fungus was transferred to all the other types of soil under test, and in each case it grew successfully. Its aerial mycelium grows toward the lower parts of the test-tubes, while the other 2 species form their aerial mycelium at the top of the soil. *P. infestans* grows best on clay, less well on leaf mold, and rather poorly on sand. The genus *Phytophthora* is not such an obligate parasite as was formerly supposed.—*J. C. Th. Uphof.*

4271. Burger, O. F. **Melanose and stem-end rot of citrus fruits.** [Abstract.] Phytopathology 13: 45. 1923.—Both diseases are caused by *Phomopsis Citri* Faw.—*B. B. Higgins.*

4272. Collins, J. Franklin. **A noteworthy case of resistance to the chestnut bark disease.** [Abstract.] Phytopathology 13: 47. 1923.

4273. Coons, G. H. **Control of stinking smut of wheat (Tilletia levis) with dust treatments.** [Abstract.] Phytopathology 13: 37. 1923.

4274. Coons, G. H., and Ray Nelson. **Yellows-resistant celery: 3rd progress report.** [Abstract.] Phytopathology 13: 56. 1923.—The disease is due to *Fusarium* sp.—*F. V. Rand.*

4275. Crépin, C. **Une maladie grave de la pomme de terre dans le Forez. [A serious disease of Irish potato in the Forez.]** Bull. Soc. Path. Vég. France 9: 237–243. *Fig. 1–2.* 1922.—Some seriously diseased potato plants had rolled leaves, but this trouble differed from true leaf-roll in that the parenchyma was soft. The cause of the disease is *Vermicularia varians* Duc.—*J. Dufrenoy.*

4276. Cunningham, G. H. **Apple and pear black spot: their appearance, cause, and control.** New Zealand Jour. Agric. 25: 20–31. *Fig. 1–12.* 1922.—The apple scab, *Venturia inequalis,* is described in detail, and pear scab, *Venturia pirina,* is briefly discussed. Destruction of fallen leaves is recommended and a detailed spray schedule is given.—*N. J. Giddings.*

4277. Cunningham, G. H. **Brown rot, Sclerotinia cinerea Schroet. Its appearance, cause and control.** New Zealand Jour. Agric. 25: 83–93. *Fig. 1–8.* 1922.—Brown rot was not particularly destructive in New Zealand until 1915, but since that time has been one of the most serious diseases of stone fruits. The disease is described in detail and control measures are fully discussed. A recommended spray schedule for leaf curl and brown rot is given.—*N. J. Giddings.*

4278. Cunningham, G. H. **Coral spot, Nectria cinnabarina (Tode) Fries. A wound parasite of fruit-trees.** New Zealand Jour. Agric. 25: 354–359. *Fig. 1–7.* 1922.—This disease is quite prevalent and causes greater injury than is usually believed. The appearance of infected tissues is described. The life history of *Nectria cinnabarina* is given. General sanitation regarding woody tissues is recommended for control.—*N. J. Giddings.*

4279. Cunningham, G. H. **Leaf curl, bladder plum and cherry curl. Their appearance, cause, and control.** New Zealand Jour. Agric. 26: 85–97. *Fig. 1–10.* 1923.—Leaf curl, *Taphrina deformans* (Fcl.) Tulasne, is quite prevalent in New Zealand. It occurs on peaches nectarines, almonds, and apricots. Hobbs Royal, Charlotte, Hale's Early, and Saunders are listed as somewhat resistant varieties.—Bladder plum, *Taphrina Pruni* (Fcl.) Tulasne, occurs on both English and Japanese varieties of plums but is most serious on the latter. Cherry curl, *Taphrina minor* Sadeb., occurs in only 2 localities in New Zealand and shows no evidence of spreading.—The 3 diseases are described in some detail and control measures suggested.—*N. J. Giddings.*

4280. Cunningham, G. H. **Leaf rust, Puccinia Pruni-spinosae Pers. Its appearance, cause, and control.** New Zealand Jour. Agric. 25: 271–277. *Fig. 1–9.* 1922.—Leaf rust is common on stone fruits in New Zealand, causing serious defoliation and injuries to the fruit. Appearance of the disease and life history of the organism are discussed. The alternate host, anemone, is not common and it is believed that the disease also overwinters in the uredo stage. Plowing under of all infected leaves and spraying with lime-sulphur are recommended as control measures.—*N. J. Giddings.*

4281. Cunningham, G. H. **Silver blight, Stereum purpureum Pers.** New Zealand Jour. Agric. 24: 276–283. *Fig. 1–8.* 1922.—Silver blight or silver leaf is common in New Zealand on almonds, apples, apricots, cherries, currants, gooseberries, nectarines, peaches, pears, plums, quinces, and many ornamental trees and shrubs. It causes losses of 1–10 per cent and is most injurious to stone fruits. Symptoms, pathological histology, life history, and preventive treatment are discussed.—*N. J. Giddings.*

4282. Cunningham, G. H. **The significances of apothecia in the control of brown rot of stone fruits.** New Zealand Jour. Agric. 25: 225–230. *Fig. 1.* 1922.—Large numbers of apothecia of *Sclerotinia cinerea* have been found growing from peach and plum mummies; detailed studies have been made and will be reported elsewhere. Cultivation is believed to be a very important factor in control as apothecia were found only where the mummies were on, or in, closely compacted soil. An apothecium was formed from a mummy buried at a depth of 3 inches.—*N. J. Giddings.*

4283. Dickson, James G. **The influence of soil temperature and moisture on the development of seedling blight of wheat and corn caused by Gibberella Saubinetii (Mont.) Sacc.** [Abstract.] Phytopathology 13: 50. 1923.

4284. Drechsler, Charles. **A new blossom-end decay of watermelons caused by an undescribed species of Pythium.** [Abstract.] Phytopathology 13: 57. 1923.

4285. Drechsler, Charles. **The occurrence of zonate eye-spot [Helminthosporium giganteum H. & W.] on various grasses and its mode of extension.** [Abstract.] Phytopathology 13: 59–60. 1923.

4286. Ducomet, V. **Observations sur le developpement du Rhizoctone de la luzerne. [The spread of Rhizoctonia on Medicago.]** Bull. Soc. Path. Vég. France 9: 312–316. 1922. —*Rhizoctonia* infects those lucerne plants suffering from drought. The only way to combat the disease seems to lie in caring for the proper nutrition of the plant.—*J. Dufrénoy.*

4287. Dufrénoy, J. **Biologie de l'Armillaria mellea. [Biology of Armillaria mellea.]** Bull. Soc. Path. Vég. France 9: 277–281. *Fig. 1–2.* 1922.—*A. mellea* proves a dangerous pathogen for trees, chiefly chestnut and walnut, when planted too deeply. Destruction of plum, cherry, and walnut orchards is recorded. Grafting of *Juglans regia* on *J. Hindsii* is advocated.—*J. Dufrénoy.*

4288. Eckerson, S. H., and James G. Dickson. **The influence of soil temperature and moisture on the chemical composition of wheat and corn and their predisposition to seedling blight. [Gibberella Saubinetii (Mont.) Sacc.]** [Abstract.] Phytopathology 13: 50–51. 1923.

4289. Edson, H. A., and M. Shapovalov. **Parasitism of Sclerotium Rolfsii on Irish potatoes.** Jour. Agric. Res. 23: 41–46. *Pl. 1–3.* 1923.—Potatoes infected with this organism may show any of the following symptoms: seed-piece rot, damping-off, stemrot, wilt or blight. When tubers are affected, a progressive soft, white rot with profuse extrusion of liquid results. Destruction of host tissue is accomplished without hyphal penetration.—Varietal strains of the fungus, both physiological and morphological, are shown to exist.—*D. Reddick.*

4290. Filley, W. O., and H. W. Hicock. **Control of the white pine blister rust in Connecticut 1909–1921.** Connecticut Agric. Exp. Sta. Bull. 237. *305–326. Pl. 23–26.* 1922.—The white pine blister rust was found in the State in 1909. White pine has been said to be essential to the practice of forestry in the State; therefore it commands much care and study. A history of the causative organism, *Cronartium ribicola,* together with its life cycle on 2 hosts is given. Measures for control instituted by the Federal Government and by the State are given. Scouting for and removal of infected *Ribes* has been carried on since 1917. Infected pines may also be destroyed. Future observation is necessary to check up the effectiveness of the removal of the 2 species infected. The possible area of serious infection is limited to about 500 square miles in the northwestern part of the State where wild Ribes plants are abundant. It has been found that infection takes place through the stomata of the leaves; also, that 2 and 3-needled pines may be infected as readily as the 5-needled pines. A survey has shown the State to contain 20,000 acres of pure pine over 25 years of age and 20,000 acres under 25 years of age. There are 150,000 acres of pine-hardwoods with more than 40 per cent of other species. The forest area of the State is 1,483,300 acres and there is a stand of pine totaling 150,000,000 board feet.—*Henry Dorsey.*

4291. Foëx, E. **La dartrose de la pomme de terre en 1922. [The dartrose disease of the Irish potato.]** Bull. Soc. Path. Vég. France 9: 244–250. 1922.—*Vermicularia varians* Duc. developed as a pathogen on potato plants in most parts of France. A relation between geographical distribution of the disease and ecological factors is indicated. To control the disease, seed from infected plants should be avoided. Seed disinfection is also advocated.—*J. Dufrénoy.*

4292. Funk, Georg. **Zur Kenntnis der Keimlingserkrankungen bei Koniferen. [Diseases of conifer seedlings.]** Forstwiss. Centralbl. 44: 381–388. 1922.—The "damping-off" of

coniferous seedlings has been attributed by various writers to a fungus (*Fusoma parasiticum* Tubeuf), the effect of excessive heating of the surface of the soil, stagnant moist atmosphere and excessive soil moisture, or combinations of these causes. Funk has found that *Fusoma* is ordinarily saprophytic, but it becomes parasitic on seedlings which are in a weakened condition. This is also the case with several other fungi of the genera *Fusoma*, *Fusarium*, and *Botrytis*, which destroy conifer seedlings. Many diseased seedlings are found to have their roots covered with minute mites, probably species of *Tyrophyphus*. It seems probable that the roots wounded by these mites are made susceptible to attack by the fungi.—*W. N. Sparhawk.*

4293. Garbowski, L. **La lutte contre le blanc de groseillier (Sphaerotheca Mors-uvae Berk. et Curt.).** [Control of gooseberry mildew.] Bull. Trimest. Soc. Mycol. Franc **38**: 98–99. 1922.—Experiments indicate that treatment with arsenite of soda in solutions of 0.01–0.02 per cent is more effective than the customary methods of applying polysulphides or powdered sulphur.—*D. S. Welch.*

4294. Gardner, Max W., and H. S. Jackson. **New aspects of apple blotch control.** [Abstract.] Phytopathology **13**: 44. 1923.

4295. Godfrey, George H. **A Phytophthora footrot of rhubarb.** Jour. Agric. Res. **23**: 1–26. *Pl. 1–12, 3 fig.* 1923.—*Rheum rhaponticum* in many parts of eastern U. S. A. is affected. A sudden wilting of outer leaves in midsummer is the first indication. The leaf stalk is girdled at the base, decays very rapidly, and secondary invaders soon appear. The root soon becomes affected and the plant dies. The prevalence of the disease is correlated with wet, cloudy weather. The disease is caused by *Phytophthora parasitica* var. *rhei* n. var. The fungus is described and compared with all other species of the genus as to cultural characters, host range, morphology, etc.—Spraying with Bordeaux mixture appears to reduce infection and this material may be used with impunity since the disease appears after the rhubarb harvest. The disease is easily carried to new places in infected roots. Surface contamination of divided roots is easily prevented by wetting the roots thoroughly with formaldehyde (1–100) and covering them for several hours.—*D. Reddick.*

4296. Graves, Arthur H. **The Melanconis disease of the butternut.** [Abstract.] Phytopathology **13**: 47. 1923.

4297. Greenwood, F. W. **Collar rot in pea crops on the Wairau plain. Some causes and preventive measures.** New Zealand Jour. Agric. **26**: 35–37. *1 fig.* 1923.—This disease, due to a species of *Fusarium*, has been very destructive to peas in certain sections, especially on sour or poorly drained soils. The use of lime is recommended. The disease does not appear to injure tares and these may be grown.—*N. J. Giddings.*

4298. Harrington, J. B. **Discussion of Hayes and Stakman's paper, "Wheat stem rust—from the standpoint of plant breeding."** Proc. Western Canadian Soc. Agron. **2**: 36–37 1921 [1922].—Suggestions are made as to important phases of the wheat stem rust problem needing further investigation, with special emphasis on the value of cooperation. [See following entry.]—*Frederick V. Rand.*

4299. Hayes, H. K., and E. C. Stakman. **Wheat stem rust from the standpoint of plant breeding.** Proc. Western Canadian Soc. Agron. **2**: 22–35. *Fig. 1–4.* 1921 [1922].—The discovery of biologic forms of stem rust of wheat has given the breeding of rust-resistant varieties a definite scientific basis. Numerous tests of biologic forms in the urediniospore stage have furnished data showing the relative stability of the individual forms. Extensive tests with various biologic forms are suggested to determine whether or not genetic segregation occurs at the time of teleutospore formation. Forms which are heterogeneous and give the X type of reaction should be favorable material for such a study. Disease resistance in

plants is inheritable in the ordinary manner. After determining the number and prevalence of biologic forms of stem rust, these forms should be used in building up wheat varieties resistant to all forms of wheat stem rust. Definite cooperation between pathologists and breeders, and between different research insitutions, is suggested. [See also preceding entry.] *Frederick V. Rand.*

4300. Henry, A. W. **Some fungi causing black point of wheat.** [Abstract.] Phytopathology 13: 49. 1923.—In inoculation tests with several fungi black point was produced by *Helminthosporium sativum*, *H.* sp., *Brachysporium*, and *Stemphylium*.—*B. B. Higgins.*

4301. Henry A. W **The pathogenicity of Fusarium moniliforme Sheldon cereals.** [Abstract.] Phytopathology 13: 52. 1923.

4302. Hopkins, E. F. **The Sphaerulina leaf spot of clover.** Phytopathology 13: 117–126. *Pl. 8–9, fig. 1–3.* 1923.—A disease produced by *Sphaerulina trifolii* E. Rostr. on various species of *Trifolium* and not previously reported in America has been found rather generally distributed. The fungus was isolated and grown in cultures and successful inoculations with pure cultures were made on *Trifolium pretense* L. and on *T. repens* L. Gross inoculations were successful on these 2 species and also on *T. hybridum* L., *Medicago sativa* L., *M. maculata* Willd., *Melilotus alba* Lam., and *M. officinale* Willd. The disease is characterized by the appearance of very small black spots on the leaf blades, petioles, and stipules. These spots finally enlarge and become pale brown in color with dark brown margins. Perithecia develop abundantly in the old spots.—*B. B. Higgins.*

4303. Howard, Nathaniel O. **The relation of an undescribed species of Pestalozzia to a disease of Cinnamomum camphora Nees & Eberm.** [Abstract.] Phytopathology 13: 47–48. 1923.

4304. Johann, Helen, James G. Dickson, and Grace Wineland. **Relation of environment to infection of corn seedlings by Diplodia Zeae (Schw.) Lev.** [Abstract.] Phytopathology 13: 52–53. 1923.

4305. Johnston, C. O. **Wheat smut investigations in Kansas: Report of progress 1920–21.** [Abstract.] Phytopathology 13: 36. 1923.

4306. Jones, L. R., J. C. Walker, and E. C. Tims. **Work upon Fusarium-resistant cabbage in 1922.** [Abstract.] Phytopathology 13: 57. 1923.

4307. Kempton, F. E. **Progress in barberry eradication.** [Abstract.] Phytopathology 13: 48. 1923.

4308. Krout, Webster S. **Apple scab control in Massachusetts.** [Abstract.] Phytopathology 13: 44. 1923.

4309. Lauritzen, J. I., and L. L. Harter. **The relation of humidity to the infection of sweet potatoes by Rhizopus.** [Abstract.] Phytopathology 13: 56. 1923.

4310. Levine, M. N., and E. C. Stakman. **Biologic specialization of Puccinia graminis secalis.** [Abstract.] Phytopathology 13: 35. 1923.

4311. Levy, E. Bruce. **Investigation of dry rot of swedes.** New Zealand Jour. Agric. 24: 336–343. *Fig. 1–6.* 1922.—Dry rot of swedes (*Phoma Napobrassicae*) is very prevalent. Soil treatment with various chemicals was tried but found impractical. The chief source of infection is soil in which a diseased crop has been grown. A 7-year rotation is suggested and it is advised that stock be kept off the field for 3 years preceding the swede crop so that the soil will not become infected through their droppings.—*N. J. Giddings.*

4312. Link, Geo. K. K., G. B. Ramsey, and Alice A. Bailey. **Botrytis rot of the globe artichoke (Cynara scolymus).** [Abstract.] Phytopathology 13: 58. 1923.

4313. Mains, E. B. **Evidence of the seed carriage of the Euphorbia rusts, Uromyces proëminens and U. dictosperma.** Proc. Indiana Acad. Sci. 1921: 137–139. 1922.—Seed from plants of *Euphorbia dentata* heavily rusted with telia of *Uromyces proëminens* were planted. Seven plants out of 60 showed infection either with pycnia or aecia or with both. Aeciospores from these infected plants were sown on 5 uninfected plants and production of uredinia and telia of *U. proëminens* resulted upon capsules and leaves. The same kind of an experiment was carried out, using seed from plants of *Euphorbia arkansana* Eng. & Gr. heavily rusted with telia of *Unomyces dictosperma* Ellis & Ev. sent from Kansas. Eleven plants out of 42 showed infection. Uredinia and telia appeared later upon most of the plants. Aeciospores were sown on uninfected plants and uredinia and telia were produced. *U. dictosperma* is a full-cycled, autoecious species. It seems evident that both rusts are seed carried.—*F. C. Anderson.*

4314. Mangin, L., et N. Patouillard. **Sur la destruction de charpentesau chateau de Versailles par le Phellinus cryptarum Karst.** [Destruction of woodwork in the castle of Versailles by Phellinus cryptarum.] Compt. Rend. Acad. Sci. Paris 175: 389–394. *Fig. 1–4.* 1922.—In addition to this species there are found *Polyporus cryptarum Fr., Boletus cryptarum Bull., Polyporus undatus Pers., Coniophora membranacea,* and *Rhyncolus culinaris* Germ. The wood was chiefly of *Xestobium rufovillosum* Deg. and *Anobium domesticum* Geoffr. A microscopic study is made of the wood infested with *Phellinus cryptarum* Bull.—*C. H. Farr.*

4315. Marchoux, E. **Mycose pulmonaire.** [Pulmonary mycosis.] Bull. Soc. Path. Exotique 15: 919–920. 1922.—An abcess in the region of the right scapula of a Frenchman from French West Africa contained yeast cells and the pus from this abscess produced fatal tumors in guinea pigs. Attempts to culture the yeast failed. The author considered it suggestive of *Monilia.—Philip Brierley.*

4316. Mehta, Karm Chand. **Observations and experiments on cereal rusts in the neighborhood of Cambridge, with special reference to their annual recurrence.** Trans. British Mycol. Soc. 8: 142–176. 1923.—Field work was carried on for nearly 2 years to determine the relative importance of the various factors which go to explain the origin of rust outbreaks year after year. At the same time extensive culture work was carried on to throw light on the physiological differences between the yellow, brown, and black rusts of wheat. In black rust, *Puccinia graminis,* it was found that both uredospores and mycelium soon lose their vitality if exposed to winter weather and, also, that direct infection of wheat by sporidia is not possible. Hence it is concluded that annual outbreaks of this rust must be caused by fresh infection with aecidiospores from barberry. The uredospores of the brown and yellow rusts, *P. triticina* and *P. glumarum,* however, germinate well at any time during the winter and so may infect young wheat plants in spring. The culture work showed that in the case of black rust specialization is not so fixed as reported by some other workers but that the brown and yellow rusts are much more rigidly specialized.—*W. B. McDougall.*

4317. Melchers, L. E. and C. O. Johnston. **Corn root, stalk, and ear rot disease investigations in Kansas: Report of progress 1922.** [Abstract.] Phytopathology 13: 52. 1923.—*Fusarium moniliforme* was found in abundance, but only traces of *Diplodia Zea* and *Gibberella Saubinetii.—F. V. Rand.*

4318. Metcalf, Haven. **White pine blister rust [Cronartium ribicola Fischer] in the Northwest.** [Abstract.] Phytopathology 13: 46. 1923.

4319. Newhall, A. G. **The importance of the Phoma stage of Mycosphaerella rubina causing spur blight of raspberries.** [Abstract.] Phytopathology 13: 44–45. 1923.

4320. Newton, Margaret. **Biologic forms of wheat stem rust in Western Canada.** Proc. Western Canadian Soc. Agron. 1: 34–35. 1920 [1921].—This constitutes a summary of a paper delivered by the author at Edmonton, Alberta, in 1920. By infection experiments she has shown that 11 distinct biological forms of wheat stem rust are present in Western Canada.—*Frederick V. Rand.*

4321. Nobécourt, Pierre. **Sur le mécanisme de l'action parasitaire du Penicillium glaucum Link et du Mucor stolonifer Ehrb.** [Mechanism of the parasitic action of Penicillium glaucum and Mucor stolonifer.] Compt. Rend. Acad. Sci. Paris 174: 1720–1722. 1922.—These fungi which are commonly saprophytes may affect various fruits and vegetables. Their destructive action is due to a substance secreted by the fungus diffusing through the flesh of the parasitized fruit. There are certain evidences that this substance is an enzyme as it is destroyed by a temperature above 60°C; its action ceases at 0°C, but recovers with a rise in temperature. Immunity to these fungi is not considered as due to resistance to this secretion.—*C. H. Farr.*

4322. Ocfemia, G. O. **Helminthosporium disease of rice.** [Abstract.] Phytopathology 13: 53. 1923.

4323. Perret, Claude. **La dessiccation prematurée des pieds de pommes de terre dans la Loire.** [Wilt of the Irish potato in central France.] Bull. Soc. Path. Vég. France 9: 257–259. 1922.—Following the drought in 1921 and 1922 many potato plants wilted in the field as early as August. Wilted plants were infected by *Vermicularia varians* Duc.—*J. Dufrénoy.*

4324. P[illichod]y, A. **Le "pourri" de la tige. (Trametes Pini.) (Ses manifestations dans les vieux peuplements de la vallée de Joux.)** [The trunk "rot". Its manifestations in the old stands of the Joux River Valley.] Jour. Forest. Suisse 72: 223–226. 1921.—*Trametes Pini* is contrasted with *T. radiciperda*, the more prevalent of the 2. It is described in detail as to the host and the means of access, the characteristic decay, the spread radially and vertically, and the typical outward manifestations. In the old stands of the Joux River Valley the rot did not produce the typical sporophores, but the fruiting bodies were produced in the form of incrustations on the underside of dead branches, close to the trunk. The rot was, therefore, mistaken for either *Polyporus annosus* or a Fomes of the *F. roburneaus* group. The rot was identified through microscopic examinations of the spores.—*G. Kempff.*

4325. S., G. N. **Pine branch twist a fungus disease on pine (Melampsora pinitorqua).** Cyprus Agric. Jour. 18: 19. 1923.—The author gives a description of the appearance of branches affected with the disease. Only 2 cases have been noted (in the Paphos forest in Cyprus, by the forest staff.—*W. Stuart.*

4326. Salmon, E. S., and H. Wormald. **A safe method of preventing "bunt" in wheat.** Jour. Ministry Agric. Great Britain 29: 722–728. 1922.—Treating wheat with a solution of copper sulphate should be abandoned as a solution of the strength necessary to kill the spores of bunt seriously impairs the germination of the seed-wheat.—A better method consists of the use of a 1–480 aqueous solution of formalin. This is sprinkled slowly over the seed wheat at the rate of 1 gallon to 2 bushels of seed, the latter being stirred until the grains are all thoroughly wet. The seed is then placed in a heap, left covered for 4 hours with sacks wet with the formalin solution, and then spread out to dry in a thin layer on a clean floor. The treated seed when dry should be sown as soon as possible.—*M. B. McKay.*

4327. Schoene, W. J. **The past, present and future of the cedar situation.** Proc. Virginia State Hort. Soc. 1922: 42–46. 1923.—This is a discussion of the status of cedar eradication as a control measure for the cedar-rust disease of apples in Virginia.—*F. D. Fromme.*

4328. Shapovalov, Michael. **Relation of potato skinspot to powdery scab.** Jour. Agric. Res. 23: 285–294. *Pl. 1–4.* 1923.—Skinspot appears on the surface of potato tubers as "round,

raised, closed pustules frequently with a depressed border, single or in aggregates of varied configuration; dark-brown or bluish brown outside and olive brown to brown inside." The name "skinspot" has no right to existence except as a matter of convenience, for the lesions are essentially and primarily the closed or immature sori of *Spongospora subterranea.* The range of this disease coincides with that of Spongospora scab. Secondary invaders such as *Oospora pustulans* in England, *Phoma cupyrena* in Germany, *Phoma tuberosa* in Maine, or *Colletotrichum atrementarium* in Pennsylvania, etc., do not contribute to the production of the lesions.—*D. Reddick.*

4329. Sharples, A. **A preliminary account of observations on the fungi causing "Brown root" disease.** Malayan Agric. Jour. 10: 181–183. 1922.—There are 3 morphologically different fungi associated with "brown root" disease: those of the brown root disease of camphor and of the Ceylon brown root disease seem to be species of *Hymenochaete;* whereas the brown root disease of Malaya has a fungus which resembles a Corticium.—*I. H. Burkill.*

4330. Spaulding, Perley. **Foreign studies of white pine blister rust.** [Abstract.] Phytopathology 13: 45. 1923.

4331. Spiekermann. **Wie kann die weitere Verbreitung des Kartoffelkrebses in Deutschland verhindert werden?** [How can the further spread of potato canker be prevented in Germany?] Mitteil. Deutsch. Landw. Ges. 38: 117. 1923.—The use of resistant varieties is said to be the only solution. The following are given as potato varieties partly or wholly immune: Parnassia, Pepo, Hindenburg, Arnika, Jubel, Preuszen, Thieles, Earliest, Kuckuck, Magdeburger Blue, Paulsens July.—*A. J. Pieters.*

4332. Stahel, Gerold. **Bijdrage tot de kennis der krullotenziekte.** [Contribution to the knowledge of witches brooms.] Dept. Landb. Suriname Bull. 39: *34 p., 8 pl.* 1919.—The disease is caused by *Marasmius perniciosus.* It was not possible to infect cocoa-buds by the mycelium taken from witches brooms. The basidiospores have to pass the cuticle or the stoma. A description is given of inoculation of the cocoa fruits. Most petrified fruits are found in May and June. In pure cultures it was never possible to obtain fruiting bodies. The mycelia form a dense mass on agar; white at first and later red, they become lemon-yellow in the full light. When placed out-of-doors in shaded pots, the mycelia become red within 2 to 3 days and produce fruiting bodies during rainy weather after 10 days. The hymenia produce but few spores in the morning, most of them being formed between 6 and 12 P.M. During the last 15–20 years the witches broom disease has caused much loss in Surinam to cocoa trees. The disease is at present eradicated by removing the witches brooms, petrified fruits, and diseased flowers every 3–4 weeks.—*J. C. Th. Uphof.*

4333. Stahel, Gerold. **De Sclerotium-ziekte van de Liberiakoffie in Suriname veroorzaakt door Sclerotium coffeicolum nov. spec.** [The Sclerotium disease of Liberia coffee in Surinam caused by S. coffeicolum n. sp.] Dept. Landb. Suriname Bull. 42. *34 p., 11 pl.* 1921. —Previous to 1917 the Sclerotium disease caused no damage, but in that year it became dangerous in Upper Surinam. The fungus is found on the leaves and the berries of Liberia, canephora, excelsa, and Abeocuta coffees where it causes brown spots hardly 0.5 cm. in diameter, with conspicuous concentric rings. By artificial inoculation the disease was also induced on the Robusta, Uganda, Mocca, and Surinam coffee varieties, but it grows only poorly on the varieties not belonging to the Liberia group. The fungus cannot attack the berries until they are about three quarters grown. It develops only in the exocarp and mesocarp and does not enter the seed, the latter germinating normally. The sclerotia are orange to brown externally, white within, flat, and up to 0.5 cm. broad. Dead berries which have fallen to the ground are sometimes entirely covered with sclerotia. On the fruit they are flattened, but larger than those on the leaves. It was not found possible to germinate the sclerotia artificially. On the underside of the leaves small "spines" are formed which are easily scattered by the wind and are composed of bundles of hyphae 5 to 8 μ in diameter. These spines are

connected with each other by many anastomoses. No spore formation has ever been found on these spines but pure cultures were made from them. They grow readily in acid but not in alkaline media. It is characteristic that the fungus itself lives only in dead tissue, the only actively parasitic period in its life being that of its entry through the cuticle or stomata. The mycelium probably excretes oxalic acid which kills the cells in the vicinity of the advancing hyphae, the latter subsisting upon the resulting dead cells. *Sclerotium coffeicolum* n. sp. is apparently related to *S. Rolfsii*.—*J. C. Th. Uphof.*

4334. Stahel, Gerold. **De Zuid-amerikaansche Hevea-bladziekte op de rubberplantage der "Lawa Caoutchouc Compagnie."** [Hevea leaf-disease in Lawa.] West Indie 4: 63–64. 1919.—The South American Hevea leaf-disease, caused by *Melanopsammopsis Ulnei* makes Para rubber culture impossible. The "Compagnie des mines d'or" near Lawa, having a plantation of 120–130 hectares, was entirely ruined by it. This plantation was 120–150 m. above sea level. In 1918 the Hevea hills were often covered with heavy fogs, causing the disease to become epidemic within 6 months. One third of the trees were killed on account of the resulting loss of young leaves. The top of the eastern slope of hills subject to northeast winds was less liable to the disease than the western slope where fog and dew remain longer. The original host of the fungus seems to be *Hevea guyanensis*, which occurs in the forests of Surinam.—*J. C. Th. Uphof.*

4335. Stakman, E. C., M. N. Levine, and D. L. Bailey. **Biologic specialization of Puccinia graminis avenae.** [Abstract.] Phytopathology 13: 35. 1923.

4336. Tapke, V. F. **Modified and simplified hot-water and vapor treatments for the control of loose smut in wheat, with special reference to seed injury.** [Abstract.] Phytopathology 13: 38. 1923.

4337. Taubenhaus, J. J., and D. T. Killough. **Recent studies on control methods of Texas root rot.** [Abstract.] Phytopathology 13: 33. 1923.—The disease affects not only cotton but also various weeds such as *Ipomoea trichocarpa*.—*F. V. Rand.*

4338. Taylor, Minnie W. **White pine blister rust infection through grafted roots.** [Abstract.] Phytopathology 13: 46. 1923.—*Cronartium ribicola* Fischer.

4339. Thompson, Noel F. **Eradicating the common barberry by means of chemicals.** [Abstract.] Phytopathology 13: 48. 1923.

4340. Walton, R. C., and C. R. Orton. **Time of apple blotch infection for 1922 in southern Pennsylvania.** [Abstract.] Phytopathology 13: 43–44. 1923.—*Phyllosticta solitaria.*

4341. Weber, George F. **III. Septoria disease of rye, barley and certain grasses.** Phytopathology 13: 1–23. *Fig. 1–9.* 1923.—In this paper Septoria leaf blotch of (1) rye, (2) barley, (3) quack grass, (4) brome grass, and (5) Kentucky blue grass are described; and a general summary and discussion of the results reported in the 3 papers is given. The disease on rye (*Secale cereale*) is caused by *Septoria Secalis* Prill. & Del. Only the leaves are attacked, producing irregular spots, in size ranging from small and almost circular to large areas often involving the entire leaf. This widely distributed disease is apparently limited to rye but does not seem to be of economic importance. The disease on barley (*Hordeum vulgare*) is caused by *Septoria Passerinii* Sacc., which attacks the leaf sheath and the leaf blade, producing indefinite yellowish areas which blend gradually into the normal green of the leaf. Inoculation tests indicate that the host range is limited to species and varieties of *Hordeum*. It has not proved of economic importance. The disease on quack grass (*Agropyron repens*) is caused by *Septoria Agropyri* E. & E. The infected leaves soon turn yellowish, die, and turn brown. In inoculation experiments infections were produced on plants of *Agropyron*

repens only. The disease on brome grass (*Bromus inermis*) is caused by *Septoria Bromi* Sacc. The infected leaves turn yellow, dry, and die prematurely. Infections were produced on *Bromus inermis* only, though other species of *Bromus* were not inoculated. A disease of Kentucky blue grass (*Poa pratensis*) produced by an unidentified species of *Septoria*, has been found at Madison, Wisconsin. Small, circular to oval spots are produced on the leaf blades. The disease is apparently different from that produced by *Septoria graminicum* Desm. Of the 8 species of *Septoria* studied, 6 are sharply specialized to the host on which they were found. The other 2, *S. Tritici* and *S. nodorum* are less specialized, since both attack wheat, rye, and *Poa pratensis*.—*B. B. Higgins.*

4342. Weniger, Wanda. **Pathological morphology of durum wheat grains affected with "black point."** [Abstract.] Phytopathology 13: 48–49. 1923.—The disease is due to *Helminthosporium sativum* P. K. & B.—*F. V. Rand.*

4343. Whetzel, H. H. **The Alternaria blight of potatoes in Bermuda.** Phytopathology 13: 100–103. *Fig. 1.* 1923.—A severe attack of early blight (*Alternaria Solani*) on potatoes (*Solanum tuberosum*), occurring in Bermuda in the early winter of 1921, is described. The unusual features noted were the suddenness and rapidity of development of the disease, the completeness of the destruction of the plants, the size of the lesions and their similarity to late blight lesions, and the occurrence of large water-soaked areas on the stems.—*B. B. Higgins.*

4344. Woolman, H. M. **Cytological studies on the infection of wheat seedlings by Tilletia Tritici (Bjerk.) Wint.** [Abstract.] Phytopathology 13: 36–37. 1923.

DISEASES CAUSED BY BACTERIA

4345. Anderson, P. J. **Controlling tobacco wildfire in the seed-bed.** [Abstract.] Phytopathology 13: 59. 1923.

4346. Brown, Nellie A. **Bacterial leafspot of geranium in the eastern United States.** Jour. Agric. Res. 23: 361–372. *Pl. 1–3.* 1923.—A leafspot of cultivated geraniums (*Pelargonium* spp.) is widespread in greenhouses and occurs occasionally in the field. It is most commonly found on cuttings or on plants that are being forced.—The disease is caused by *Bacterium Pelargoni* n. sp. The organism is described in detail and is compared with *B. Erodii* Lewis which it resembles in many details. Infections were produced under warm, moist conditions and poor ventilation. The disease disappears when these growth conditions are corrected.—*D. Reddick.*

4347. Brown, Nellie A. **Experiments with Paris daisy and rose to produce resistance to crown gall.** Phytopathology 13: 87–99. *Pl. 3–4, fig. 1–4.* 1923.—Two attempts were made to develop resistance to *Bacterium tumefaciens* Sm. & Towne. in the Paris daisy by taking cuttings from galled plants through successive generations. The plants were inoculated through needle pricks. After galls were well developed, cuttings were made from the galled stems. After these cuttings had started growth and were developing rapidly they were likewise inoculated. No decided resistance was developed; in fact the plants were gradually devitalized. Those of 1 series died in the 5th and the other series in the 7th galled generation. With roses several crosses were made between commercial varieties. The plants were inoculated and the seed allowed to develop on galled stems. Of the resulting seedlings only 1 (Mrs. Charles Russell × Sunburst) showed evidence of resistance. By the end of 2 years this resistance had been lessened so that the plants from this cross also galled readily.—*B. B. Higgins.*

4348. Clinton, George P., and Florence A. McCormick. **Wildfire of tobacco in Connecticut.** Connecticut Agric. Exp. Sta. Bull. 239. *365–423. Pl. 29–32.* 1922.—A tobacco disease survey during the period 1920–1921 disclosed the presence of the bacterial leaf-spot disease, wildfire (*Bacterium tabacum*), in Hartford, Tolland and Litchfield Counties, with the

greatest center of infection north of Hartford in Hartford County. The possible methods of the introduction and further dispersal of the disease in the State are pointed out. The appearance of the diseased plants both in the seed bed and in the field is described at length. Control measures are suggested as follows: (1) sterilize beds, boards, and sash of the seed bed or use beds made on new uninfected land; (2) use seed from a field free of wild fire; (3) use as little water on plants as will give good growth, and air the beds day and night when feasible; (4) spray the plants with 4–4–50 Bordeaux mixture; (5) set out the fields with plants from uninfected beds; (6) a week after setting out remove diseased plants, repeating the process 7–10 days later; (7) badly infected fields should be plowed and reset with healthy plants; (8) with primed tobacco the infected and non-commercial leaves may be removed and destroyed.—A bibliography of 34 numbers is included.—*Henry Dorsey.*

4349. Levine, Michael. **Studies in plant cancers. V. Leafy crown galls on tobacco plants resulting from Bacterium tumefaciens inoculations.** Phytopathology 13: 107–116. *Pl. 5–7.* 1923.—Tobacco plants were inoculated with *Bacterium tumefaciens* in the leaf axils, in the stem internodes, and in the midrib of the leaves. A trocar, 0.5 millimeter in diameter, was inserted and the tissue removed and replaced by a drop of the bacterial suspension. Leafy crown galls resulted from many of the inoculated leaf midribs and from inoculated stem internodes as well as from the inoculated leaf axils. These leafy crown galls were of 2 types. Those produced on the leaf midribs and on the stem internodes evidently resulted from differentiation in the crown gall tissue, while some of those in the leaf axils resulted from abnormal growth of the axillary bud. The latter type was larger, with a more distinct stem. Occasionally both types developed in a single leaf axil.—*B. B. Higgins.*

4350. Quanjer, H. M., en J. Hudig. **De aardappelschurft met betrekking tot klimaat en bodem. [Potato scab in relation to climate and soil.]** Cultura 35: *1–12. 2 pl.*, 1923.—Potatoes fertilized with superphosphate and sulphate of ammonia were smooth, but the addition of a small amount of marl resulted in a slight amount of scab. Slag, nitrate of soda, and marl gave very scabby tubers. The tubers become scabby on alkali land but healthier when the land is acid.—*J. C. Th. Uphof.*

4351. Reddy, Charles S., and James Godkin. **A bacterial disease of brome-grass.** Phytopathology 13: 75–86. *Pl. 1–2.* 1923.—A new disease of brome grass (*Bromis inermis*) occurring in Wisconsin and North Dakota, has been under investigation during the past 3 years. On the leaves spots are produced which are at first light olive-green, circular to elliptical water-soaked areas with light brown centers. Later the color changes to a dark chocolate or purplish-brown. Old spots are usually linear but often coalesce and destroy the entire leaf. The disease is produced by a non-motile, rod-shaped *Bacterium* similar morphologically to *Bacterium coronafaciens* Elliott. It differs from this species in pathogenicity on certain hosts and in the character of the spots produced. It is therefore described as *Bacterium coronafaciens* Elliott var *atropurpureum* n. var. The organism has also been found parasitizing quack grass (*Agropyron repens*), and by artificial inoculation has been caused to attack oats (*Avena sativa*) and various species of *Bromus.*—*B. B. Higgins.*

4352. Riker, A. J. **Some morphological responses of the host tissues to the crown-gall organism.** [Abstract.] Phytopathology 13: 43. 1923.

4353. Riker, A. J. **The location of the crown-gall organism in its host tissues.** [Abstract.] Phytopathology 13: 43. 1923.

4354. Sanford, G. B. **The potato scab problem.** Proc. Western Canadian Soc. Agron. 2: 71–81. 1921 [1922].—This discussion includes the history of the problem, description of the causal organism (*Actinomyces scabies*), its relation to temperature, the factors concerned in its distribution, methods of scab prevention, and disease resistant varieties.—The organism is present in all normal soils, especially those rich in organic material. The irregularity in

the results of control measures suggests other more important factors in controlling or favoring the disease; from experimentation and observation it is suspected that moisture is 1 of these.—*Frederick V. Rand.*

4355. Taylor, W. H. **Tomato diseases. Black-stripe and its control.** New Zealand Jour. Agric. **26:** 101–103. 1923.—Black stripe disease (*Bacillus lathyri* Manns and Taub.) of tomatoes, causing serious losses to tomato growers, is largely influenced by the kind and amount of fertilizer used. Excess nitrogen or heavy manuring favor the disease, but it may be overcome by applications of sulphate of potash used at the rate of about ¼ ounce per plant.—*N. J. Giddings.*

4356. Valleau, W. D. **An important period in the life history of two bacterial organisms causing leaf-spots on tobacco.** Phytopathology 13: 140–144. *Fig. 1.* 1923.—Observations on seedbed infection of tobacco plants with angular leaf spot and wildfire led to the belief that the causal bacteria, when introduced on the seed or otherwise, multiply rapidly in the seedbed soil and attack the leaves which lie in contact with this infested soil. It seemed possible, therefore, that the addition of some toxic agent might prevent this multiplication of the bacteria in the soil. In an experiment in which sulphur was added to the soil at the rate of 500, 1000, and 2000 pounds per acre, no leaf spot appeared in any of the treated plats, while it developed abundantly in a control plat receiving no sulphur. Because of injury to the stand in the treated plats, the use of sulphur is not recommended.—*B. B. Higgins.*

4357. Vriend, J. **Stachytarpheta vatbaar voor Slijmziekte.** [**Stachytarpheta susceptible to slime sickness.**] Deli-Proefsta. Medan. Vlugschrift 16. *4 p., 1 fig.* 1922.—The author showed by infection experiments that the bacterial wilt disease of tobacco and tomato also attacks the common verbenaecous weed *Stachytarpheta indica* Vahl.—*A. J. Pieters.*

4358. Waters, R. **Fireblight.** New Zealand Jour. Agric. 24: 350–357; 25: 209–214. *Fig. 1–9.* 1922.—A brief history of the disease, its distribution, hosts, methods of dissemination, character and results of inoculation experiments are given. A new insect carrier (*Sephena cinerea*) is reported. The problem of fireblight control in New Zealand is seriously complicated by the great number of hawthorn hedges. Special legislation has been enacted giving the government authority to adopt such measures as may seem essential in orchard sections.—*N. J. Giddings.*

DISEASES CAUSED BY ANIMAL PARASITES (INSECTS, NEMAS, PROTOZOANS, ETC.)

4359. Baunacke, W. **Untersuchungen zur Biologie und Bekämpfung des Rübennematoden Heterodera schachtii Schmidt.** [**Investigations of the biology and control of the rape nematode Heterodera schachtii.**] Arbeit. Biol. Reichsanst. Land- u. Forstw. 12: 185–288. *Pl. 1–5.* 1922.—The nematode question in Germany is more than ever one of great agricultural importance. The wide occurrence of the rape malady, and the power of *Heterodera schachtii* for rapid adaptation, reproduction, and dissemination, endanger the culture of other important crops. Practical means for the extermination of the nematodes in diseased soil have not been known heretofore.—The brown resting cysts are the carriers of the disease. The content of these cysts in the soil and the depth of their occurrence indicate the degree of disease. The larvae escaping from the cysts at once seek the host plants. This larval behavior permits the use of bait both in examination of the soil for infestation and for control. With the aid of the larvae in the cysts, the parasitic inclinations of stocks of *Heterodera* upon cultivated plants can be ascertained.—The behavior of wandering larvae is influenced by thermal and chemical stimuli. Unfavorably high or low soil temperatures check their energy and cause them to become quiescent. Favorably warm temperatures increase their activity to a maximum, the latter being reached at 25°C. The concentration of water-soluble metabolic products of host plant roots, decreasing with distance, is perceived as a positive stimulus. The precision of larval movement from remote distances to the host plant, as well as the power to distinguish sharply unaccustomed or unsuitable food plants, finds its explanation in

this finely marked chemical sensitivity. Larvae remaining latent in the interior of cysts and embryos enclosed within eggs are also in a high degree sensitive to these thermal and chemical stimuli. The use of these chemical stimuli in a way corresponding to natural events makes it possible to bring newly formed 1-summer cysts to complete emptiness in a few weeks, where otherwise a year is required. The evacuation of the cysts takes place apart from the host plant, under the influence of root excretions alone.—A small number of highly specialized strains of *Heterodera* retain general powers of adaptation. They make possible the preservation of the species under altering conditions of existence, as well as the rapid adaptation to new host plants. The tenacious persistence of the nematodes in soil is explained by the extremely many-sided system of species preservation and distribution by which the parasites progress in development under favorable conditions but resist those that are adverse.—Control measures are directed against the resting cysts. The chief mass of these may be destroyed in autumn by sprinkling the ground just before the plow with a 1 per cent solution of ammonia (this may be concentrated to 2 per cent where water is scarce). In conjunction with this treatment, it is recommended that a stimulative crop (i.e., one that the nematodes especially prefer) be sown thickly as soon as the productive crop is cleared away. This stimulative crop, growing during the chief developmental period of the parasites, activates the deep-lying cysts, which are destroyed by the disinfection that follows. These control measures are to be repeated the next year, and until examination of the soil shows no infestation.—*W. S. Beach.*

4360. Cory, Ernest N. **Dusting for the pea aphis.** Jour. Econ. Entomol. 16: 81–84. 1923.—Dusting is most promising for pea aphis control. The principal tests were to determine the most effective percentage of nicotine. A high nicotine content and not less than 30 pounds of dust per acre are preferable. The use of a trailer of canvas is advised. There should be at least 50 per cent of the vines infested when dusting is begun.—*Author's abstract.*

4361. DeLong, D. M. **Results of spraying and dusting for the control of the red spider (Paratetranychus pilosus).** Jour. Econ. Entomol. 16: 8–90. 1923.—A lime sulphur wash, 1–40, easily controls red spider, though it is too strong for prune foliage, which at times may be seriously injured by 1–75. The control by various sulphur dusts in combination with arsenate of lead or nicotine did not vary greatly, ranging from 50 to 60 per cent. Soap added to a lime-sulphur wash, increases its value by at least 5–10 per cent. A 1-per cent lime-sulphur with 6 pounds of sulphur paste for each 100 gallons and 1 pound of resin fish oil soap gave very satisfactory control.—*From Author's Abstract.*

4362. Franchini, G. **Action du latex d'Euphorbes sur différents trypanosomes. Culture de flagellés dans des latex divers.** [Action of the latex of Euphorbias on different trypanosomes. Culture of flagellates in the latex of various plants.] Bull. Soc. Path. Exotique 16: 41–50. 1923.—Five species of *Trypanosoma* from blood of man or of animals lived longer in glass slide mounts in fresh Euphorbia latex than in physiological solution or citrate solution. —Three species of *Herpetomonas*, 2 of *Trypanosoma*, and 1 other flagellate were cultivated in autoclaved latex or latex plus boullion. Growth was obtained in latex of 6 species of Euphorbiaceae, 4 of Apocynaceae, 2 of Asclepiadaceae, 2 of Urticaceae, 1 of Artocarpeae, and 2 of Sapotaceae. None of the organisms grew in latex of Menispermeae (1 species) or Anacardiaceae (1 species) tried, and *Herpetomonas Ctenocephali* grew in none of the latex tried. *Trypanosoma Lewisi* changed to Crithidian and Herpetomonoad forms more quickly in latex than in N. N. N. medium, and *T. Gambiense* soon formed leishmaniform parasites. Flagellates cultured in latex sometimes showed evident changes of form. *Herpetomonas pyrrhocoridis* cultured in latex of *Euphorbia calyculata* sometimes showed an oval swelling of the anterior extremity and a spiral twisting of the body. Such swelling and twisting has been observed in the flagellates found in fresh latex of *Euphorbia*, but has not appeared before in *Herpetomonas pyrrhocoridis* during 3 years of culture in various media.—*Philip Brierley.*

4363. Franchini, G. **Essais d'inoculation au chat d'amibes du latex de plantes. [Trial inoculations of cats with amoebae from plant latex.]** Bull. Soc. Path. Exotique 15: 931–933. *Fig. 1.* 1922.—Amoebae from the latex of *Acokanthera venenata* and *Plumeria alba* (Apocynaceae) caused temporary sickness in 2 kittens when inoculated into the rectum. Amoebae were not infrequent in the feces during the period of sickness and some of them had ingested red blood corpuscles. When the kittens recovered, amoebae were no longer found. Inoculation of a 3rd kitten with a culture from the latex of *Ficus carica* "very poor in amoebae" was without result.—*Philip Brierley.*

4364. Franchini, G. **Protozoaires de Muscides divers capturés sur des euphorbes. [Protozoans of various Muscidae collected on Euphorbias.]** Bull. Soc. Path. Exotique 15: 970–978. *Fig. 1–4.* 1922.—Protozoans were abundant in the digestive tracts of flies (*Sarcophaga, Muscina, Graphomyia, Anthomyia*) visiting *Euphorbia palustris* near Bologna, Italy. Flagellates were most common, but forms resembling "gregarines libres" and spirochetes were also seen; some of these forms are figured. Some stages of these flagellates resemble the forms described from *Euphorbia* latex. Latex of *Euphorbia* was recognized in the digestive tract of *Anthomyia*. Droplets of latex extruded from the corolla may become mingled with feces of visiting flies; transfer of flagellates in the feces of flies is thus suggested. The 3 plants on which insects were collected were "very vigorous"; no protozoans were detected in the latex except that leishmaniform parasites were occasional in 1 plant.—*Philip Brierley.*

4365. Hinds, W. E., and F. L. Thomas. **Poisoning the boll weevil.** Alabama Agric. Exp. Sta. Bull. 212. *51–84.* 1920.—The results indicate that power dusting and hand dusting are profitable for low-yielding and even more profitable for high-yielding cotton. It was found that moisture supplied by fine spray does not increase the killing efficiency of arsenate of lead. Every effort should be made to continue dusting at 4- or 5-day intervals in spite of threatening weather.—*Wright A. Gardner.*

4366. Kinsey, Alfred C. **Life histories of American Cynipidae.** Bull. Amer. Mus. Nat. Hist. 42: 319–357. *Pl. 28–31.* 1920.—The paper gives descriptions of plant-galls but is principally a discussion of the life histories of the insects causing them.—*Frank E. Lutz.*

4367. Kinsey, Alfred C. **New Pacific Coast Cynipidae (Hymenoptera).** Bull. Amer. Mus. Nat. Hist. 46: 279–295. *Pl. 24.* 1922.—This paper gives descriptions of plant-galls and the insects causing them.—*Frank E. Lutz.*

4368. Kinsey, Alfred C. **New species and synonymy of American Cynipidæ.** Bull. Amer. Mus. Nat. Hist. 42: 293–317. *Pl. 20–27.* 1920.—This paper gives descriptions of plant-galls but principally of the insects causing them.—*Frank E. Lutz.*

4369. Kinsey, Alfred C. **Phylogeny of Cynipid genera and biological characteristics.** Bull. Amer. Mus. Nat. Hist. 42: 357*a–c*, 358–402. *Pl. 32.* 1920.—This paper is chiefly concerned with the insects causing plant-galls.—*Frank E. Lutz.*

4370. Marié, P. **Influence des coupes de bois faites en 1920–1921 sur le développement des Scolytidae propres au Chêne. [Influence of cuttings on the spread of the oak Scolytidæ.]** Bull. Soc. Path. Vég. France 9: 306–311. 1922.—The year 1921 was the dryest in France for centuries, the rainfall having been less than half that of normal years. Where cuttings were made, the oaks left standing suffered much from sun exposure and were readily attacked by *Xylerobus monographus* Fabr. and *Platypus cylindrus* Fabr., beetles which preferably invade trees exposed to the sun.—*J. Dufrénoy.*

4371. Parrott, P. J., and Hugh Glasgow. **The insecticidal properties of tobacco dust.** Jour. Econ. Entomol. 16: 90–95. 1923.—The insecticidal properties of tobacco dust on an average were not uniformly as high as that of dust mixtures containing nicotine sulphate.

The concentrated tobacco solutions are apparently more economical than powdered tobacco. —*From Author's abstract.*

4372. Sasscer, E. R., and C. A. Weigel. **Further data on fumigation with hydrocyanic acid gas in greenhouses on a commercial basis.** Jour. Econ. Entomol. **16**: 84–87. 1923.—The formula used was 1 ounce averdupois sodium cyanide, 1½ liquid ounces sulphuric acid (1.83 specific gravity), and 3 fluid ounces of water. Frequent 1-hour exposures in a greenhouse containing a large number of different plants, were followed by no permanent injury, though temporary burning occurred on such plants as Jasminum, Salvia, etc., and the insects were practically eliminated except mealy bugs and these greatly reduced by the killing of immature larvae. Results are also given for the fern scale, the camphor scale, and the Florida red scale.—*Author's abstract.*

INFECTIOUS CHLOROSES (MOSAIC AND PEACH YELLOWS GROUPS, ETC.)

4373. Atanasoff, D. A. **A study into the literature on stipple-streak and related diseases of potato.** Mededeel. Landbouwhoogeschool Wageningen **26**[1]: *52 p.* 1922.—The writer divides the literature into 2 periods: (1) 1775 to 1900 and (2) 1900 to 1922.—*J. C. Th. Uphof.*

4374. Atanasoff, D. A. **Stipple-streak disease of potato.** Mededeel. Landbouwhoogeschool Wageningen **24**[5]. *32 p., 5 pl.* 1922.—In Holland the stipple-streak disease has been seen on a number of varieties. On Schotsche muis, Atlanta, Duke of York II, and Early Potato, all early sorts, it has been observed in epidemic form, 20–75 per cent of the plants being infected. In other varieties the disease has been sporadic. In some fields in the Province of North Holland over 75 per cent of the plants were heavily infested or dead before the end of May. On the vines the symptoms of primary stipple-streak vary more or less according to variety, being more numerous and more pronounced in the early, succulent, and light green varieties. The symptoms are at first several, and later more uniformly distributed, dark brown to black, slightly sunken spots between the veins of the lower or middle leaves. Tubers of some varieties at time of digging may be apparently healthy, but when kept for some time, usually 2–3 weeks or longer, show the presence of the disease. In other cases the tubers show distinct pathological effects including pronounced blisters, and early shrinkage. Many tubers from stipple-streak plants never form sprouts. This disease, like leaf-roll and mosaic, is a systemic disease. Sometimes the pathogen, travelling down the infected plant, passes through the mother tuber into the base of the still healthy sister shoots and outward through the stolons into their tubers before reaching other aerial portions. Experiments showed conclusively that the pathogen cannot pass from plant to plant through the soil, water, or air. Thus far it has been possible to transmit this disease from infected to healthy plants only by creating an organic connection between them, as by grafting or by joining sections of healthy and infected tubers. Temperature has a very marked influence upon the appearance and development of stipple-streak, a low temperature retarding the disease. Positively infected tubers disinfected in 2 per cent copper sulphate for 1–2 hours, and in 2 per cent mercuric chloride for 30 minutes, when planted gave secondary disease in all cases. When heated in dry air at 44–46°C. for 5–24 hours a similar result was obtained. Prompt and careful elimination of the infected tubers and young plants showing the disease will be an effective control measure.—*J. C. Th. Uphof.*

4375. Brandes, E. W. **Mechanics of inoculation with sugar-cane mosaic by insect vectors.** Jour. Agric. Res. **23**: 279–283. *Pl. 1–2.* 1923.—Insects feeding on sugar-cane leaves were killed *in situ* and histological examinations made. *Aphis maidis*, a known carrier of mosaic, usually pushes its beak through a thin place in the cuticle of the guard cell of a stomate, then either directly through or between the mesophyll cells, through the starch sheath and into the phloem. Throughout the process of penetration there is a copious salivary secretion. This secretion is thought to be the specific medium by which the infective principle is introduced into the plant. *Peregrinus maidis* and *Draeculacephala mollipes*, neither of which is known to transmit the disease, do not seem to seek the phloem in particular but the large size

of their setae as compared with vascular bundles is such as to preclude a positive statement.—*D. Reddick.*

4376. Chardon, C. E., and R. A. Veve. **The transmission of sugar cane mosaic by Aphis maidis under field conditions in Porto Rico.** Phytopathology **13**: 24–29. *Fig. 1.* 1923.—Although the experiments of Brandes and others have shown that *Aphis maidis* is able to transmit the infective principle of sugar cane mosaic, the fact that this insect is rarely found on sugar cane has caused considerable doubt as to its being responsible for the spread of the disease in the field. Inspection showed that aphids were present in practically every cane field in Porto Rico, not on the cane itself, but on various wild grasses in the fields. When the fields were weeded and the wild grasses killed the aphids passed to the cane, congregating in the central whorl of leaves. This was followed by a sudden increase in mosaic infection. This migration of the aphids and their transmission of cane mosaic has been demonstrated experimentally. Of the wild grasses growing in an experimental cage with diseased cane, 3 (*Syntherisma sanguinalis Eleusine indica,* and *Echinochloa colona*) developed typical mosaic symptoms.—*B. B. Higgins.*

4377. Dickson, B. T. **Temperature studies in mosaic diseases.** [Abstract.] Phytopathology **13**: 42. 1923.

4378. Dickson, B. T., and E. G. Hood. **Temperature studies in mosaic diseases.** [Abstract.] Phyotpathology **13**: 42. 1923.

4379. Fernow, Karl H. **A new host for potato mosaic.** [Abstract.] Phytopathology **13**: 40–41. 1923.—*Nicandra physaloides* is the new host plant under discussion.—*B. B. Higgins.*

4380. Fernow, Karl H. **Spindling tuber or marginal leaf-roll.** [Abstract.] Phytopathology **13**: 40. 1923.

4381. Link, Geo. K. K. **Mosaic and leaf roll of the potato in the Northwest.** [Abstract.] Phytopathology **13**: 39. 1923.

4382. McKinney, H. H., Sophia H. Eckerson, and R. W. Webb. **Intracellular bodies associated with a "mosaic" of Hippeastrum Johnsonii.** [Abstract.] Phytopathology **13**: 41–42. 1923.

4383. McKinney, H. H., Sophia H. Eckerson, and R. W. Webb. **Intracellular bodies associated with the rosette disease of wheat.** [Abstract.] Phytopathology **13**: 41. 1923.

4384. MacMillan, H. G. **Potato mosaic masking at high altitudes.** [Abstract.] Phytopathology **13**: 39. 1923.

4385. Nelson, Ray. **The occurrence of protozoa in plants affected with mosaic and related diseases.** [Abstract.] Phytopathology **13**: 41. 1923.

4386. Newhall, Allen G. **Seed transmission of lettuce mosaic.** Phytopathology **13**: 104–106. 1923.—Field observations led to the belief that lettuce mosaic was seed-transmitted, and careful greenhouse tests demonstrated the correctness of this belief. Seed saved from diseased lettuce plants were planted in steam-sterilized soil and covered with cheesecloth to prevent access of insects. Twenty-four days later 45 of the 1,465 plants from these seed showed typical symptoms of mosaic.—*B. B. Higgins.*

4387. Salmon, E. S. **The "mosaic" disease of the hop.** Jour. Ministry Agric. Great Britain **29**: 927–934. *Fig. 1–3.* 1923.—"The 'mosaic' disease of the hop—which is apparently similar in many respects to the well-known 'mosaic' disease of the potato, tomato, tobacco

and other plants—is proving extremely destructive and very contagious. The hop plant once attacked never recovers and is usually killed in one or two seasons; an infected plant not grubbed up serves as a source of infection which quickly spreads the disease.—Observations have shown that the disease can be carried in the cuttings of hop-plants.—The systematic 'rogueing' of hop gardens in early summer and again just before hop picking is recommended to prevent the spread of the disease."—*M. B. McKay.*

4388. Schultz, E. S., and Donald Folsom. **Spindling-tuber and other degeneration diseases of Irish potatoes.** [Abstract.] Phytopathology **13**: 40. 1923.

4389. Weber, George F. **Mosaic disease of sweet potato.** [Abstract.] Phytopathology **13**: 42–43. 1923.

PARASITIC PHANEROGAMS

4390. Delacoste, F. **Le gui sur l'épicéa. [The mistletoe on spruce.]** Jour. Forest. Suisse **73**: 90–91. *1 fig.* 1922.—In 1918 the oak mistletoe (*Viscum album*) was discovered by the author for the first time on *Picea excelsa* in a forest of Saxon, Valais, and also very recently near St. Maurice at 600 m. altitude, with dry soil and northeastern exposure, in a stand composed of Scotch pine, white fir, larch, and Norway spruce. It was found in large and numerous brooms on the first 2 species, not at all on the 3rd, and in exceptional cases on the 4th.—*G. Kempff.*

4391. Henricher, E. **Mistelträger im Botanischen Garten zu Innsbruck. [Hosts of mistletoes in the botanical garden at Innsbruck.]** Ber. Deutsch. Bot. Ges. **39**: 291–295. 1921. —In 1910 the author made sowings of seed of *Viscum album* on a number of plants. This paper reports 30 species, which had mistletoe plants growing upon them in 1921, representing the following genera: *Pinus, Abies, Larix, Picea, Salix, Populus, Betula, Carpinus, Corylus, Alnus, Loranthus, Viscum, Pyris, Crataegus, Rosa, Cytisus, Robinia, Tilia, Fraxinus, Olea,* and *Syringa.*—*W. C. Muenscher.*

4392. Korstian, Clarence F., and W. H. Long. **The western yellow pine mistletoe: effect on growth and suggestions for control.** U. S. Dept. Agric. Bull. 1112. *35 p., 5 pl., 4 fig.* 1922.—*Pinus ponderosa* Laws. is subject to severe injury by mistletoe (*Razoumofskya cryptopoda* Engelm.), resulting in serious losses and presenting one of the most important silvicultural problems in the Southwest. "Mistletoe infection causes a marked decrease in the rate of growth of the host, which continues until the virulent parasite ultimately causes the death of the tree." The decrease in the growth rate of the tree is accompanied by a reduction of the leaf surface, and the trees are rendered practically worthless for seed production. The most practical method of control is to remove the infected tree while cutting operations are in progress. A sanitation clause should be inserted in timber-sale contracts when the areas contain much mistletoe, requiring the cutting of all heavily infected or marked moderately infected trees whether merchantable or unmerchantable, and when the entire stand is too heavily infected the areas should be marked for clear cutting under a mistletoe control project. On areas of light to moderate infection diseased trees should be marked for removal and "exceptional care should be taken to leave as heavy a stand of healthy trees as possible in order to compensate for the removal of diseased trees and to maintain better forest conditions."—*J. T. Buchholz.*

4393. Morris, A. **Some notes on mistletoes.** Australian Forest. Jour. **5**: 325–327. 1922.—The hosts are given for several species of mistletoe belonging to the genus *Loranthus.* Double parasitism is common; *L. exocarpi* grows upon *L. pendulus* and *L. quandang.*—*C. F. Korstian.*

NON-PARASITIC DISEASES

4394. Brown, H. D., and Max W. Gardner. **Lightning injury to tomatoes.** Phytopathology 13: 147. *Fig. 1.* 1923.

4395. Gard, Méd[éric]. **Sur le dépérissement des jeunes noyers en 1922.** [Die-back of young walnut trees.] Bull. Soc. Path. Vég. France 9: 263–266. 1922.—The killing of twigs, the cortex of which blackens and oozes a black liquid, is ascribed to frosts in November.—*J. Dufrénoy.*

4396. Harter, L. L., J. I. Lauritzen, and J. L. Weimer. **Internal breakdown of sweet potatoes.** Phytopathology 13: 146–147. 1923.—A pithy condition of sweet potatoes [*Ipomoea batatas* L.] is apparently caused by storage conditions.—*B. B. Higgins.*

4397. Rhoads, Arthur S. **The formation and pathological anatomy of frost rings in conifers injured by late frosts.** U. S. Dept. Agric. Bull. 1131. *15 p., 6 pl.* 1923.—Pathological anatomy of late-frost injury has been studied in detail in 17 conifer species and in apple and pear trees. Characteristic disturbances in the tissue of the growth rings are produced, or extra rings, called *frost rings*, may form at the time of the injury. The injuries involve crumpling of the tender wood cells, a broadening and proliferation of medullary rays with or without their lateral displacement, the presence of radial clefts subsequently filled up by large-celled parenchyma, and more or less broad zones of wound parenchyma. Frost rings may be caused by late or early frost or by freezing of the cambium during the winter when the tree is dormant. Young shoots injured by late frost may wilt and upon recovery bend the point upward, resulting in permanently distorted stems, or they may be killed outright to be replaced by 1 to several volunteer shoots. Late frost injury when occurring after a considerable portion of the growth ring has been formed, results in a false or double ring, very confusing in age determinations. This late frost injury has not been observed in coniferous stems of greater diameter than 2 inches but occurs in larger stems of fruit trees subject to frost injury. Frost rings constitute a plane of weakness in the wood predisposing to the formation of circular shake as well as rendering the wood less valuable where great strength is required in small manufactured pieces.—*J. T. Buchholz.*

4398. Sharples, A. **A consideration of recent work on the brown bast problem.** Malayan Agric. Jour. 10: 155–170. 1922.—The author concludes that this disease of the Para rubber tree, *Hevea brasiliensis*, is of physiological origin, non-transmissible, and increased by heavy tapping.—*I. H. Burkill.*

4399. Waters, R. **Apple flesh-collapse or brown-heart. Some recent investigational work.** New Zealand Jour. Agric. 25: 334–340. 1922.—Experimental evidence to date indicates that brown heart is due in part to the conditions of cool storage and in part to the maturity of fruit and its method of handling previous to storage. It is believed that intermittent cooling will give better results than running the plant continuously.—*N. J. Giddings.*

4400. Waters, R. **Cool storage of apples.** New Zealand Jour. Agric. 25: 34-39. 1922. —This is an investigation of flesh collapse. This disease, a breaking down of the internal tissues, is very prevalent. Investigations indicate that it is partly due to cold storage conditions.—*N. J. Giddings.*

DISEASES OF UNKNOWN CAUSE

4401. Bioletti, Frederic T. **Black measles, water berries and related vine troubles.** California Agric. Exp. Sta. Bull. 358. *509–524.* 1923.—The theory advanced is based chiefly on observations of the 2 great epidemics, of sporadic cases occurring in many districts over a period of many years, and on a consideration of the coincident environmental conditions in the various cases. It is, briefly, that these diseases are entirely or primarily the effect on the

vines of an excess of output over income and the resulting condition of starvation or malnutrition. The remedies offered are those which naturally suggest themselves if this theory is accepted. They are based on the principle of affording some means of keeping a proper balance between the demands on the vine and its ability to perform, and consist on the one hand in measures tending toward its invigoration, such as improvements in irrigation, cultivation, soil treatment, and the control of known pests and diseases; and on the other in measures tending toward apportioning the amount of crop on the individual vine, arm or cane, in accordance with its size, vigor, and condition of nourishment. The principal, perhaps the sole, measures that can be used for the latter purpose are various degrees and kinds of pruning which determine the number of fruit buds on which a vine is allowed to expend its energies.—Vines showing water berries and black measles, if still alive and showing even a small growth of mature wood and no extensive dead parts, may usually be saved by short pruning (down to base-buds in severe cases) and by fertilization and other cultural measures which tend to invigorate the plants.—*A. R. C. Haas.*

4402. Dufrénoy, Jean. **Sur la tuméfaction et la tubérisation. [On the formation of tumors and tubers.]** Compt. Rend. Acad. Sci. Paris. **174:** 1725–1727. *Fig. 1–3.* 1922.—Observations are made on *Eucalyptus eugenoides* and on *Arbutus Unedo*. The tumors are found to be very rarely bacterial. Both hyperplasia and hypertrophy occur.—*C. H. Farr.*

4403. Gard, M. **Sur le dépérissement des jeunes noyers en 1922. [The decay of young walnut trees in 1922.]** Compt. Rend. Acad. Sci. Paris **175:** 716–718. 1922.—This is a recently discovered disease causing decay of the aerial part of the entire tree. It occurs in spring and early summer on trees 10–20 years old, and in some cases on trees 50–60 years old. A description of the external and internal lesions is given. No parasitic organism was found present in all lesions. Similar effects were also noted to a less degree on figs, noble laurel, and grape. —*C. H. Farr.*

4404. Harter, L. L., J. I. Lauritzen, and J. L. Weimer. **Mottle-necrosis of sweet potatoes.** Phytopathology **13:** 145–146. *Fig. 1.* 1923.—A disease of sweet potatoes, characterized by the presence of brown necrotic areas in the tissue of the fleshy roots, was rather abundant about Washington, D. C., during 1922.—*B. B. Higgins.*

4405. Lee, H. Atherton. **Sereh disease of sugar cane in Singapore.** Phytopathology **13:** 145. 1923.—The sereh disease was found at Singapore Botanical Garden on sugar cane introduced from Java. Attention is called to the danger incurred in importing cane from Java, because of the serious cane diseases which occur there.—*B. B. Higgins.*

4406. McClintock, J. A. **Aerial galls of peach.** [Abstract.] Phytopathology **13:** 45. 1923.

4407. Stahel, Gerold. **De zeefvatenziekte (Phloëemnecrose) van de Liberiakoffie in Suriname. [Phloemnecrosis of Liberia coffee in Surinam.]** Dept. Landb. Suriname Bull. 40. *40 p., 5 pl.* 1920.—Phloemnecrosis in Surinam shows 2 forms: (a) the acute form formerly called root disease, and (b) the chronic form. In the acute form all of the apparently healthy leaves suddenly wither without first becoming yellow. Within a few weeks the entire tree is dead. It is characteristic that the black, dead leaves do not drop off as they are unable to form a schizophellogen layer at the base of the petiole. The rootlets are black instead of white as in the healthy trees. In the chronic form the trees do not die suddenly but the leaves become at first light green or yellowish and the old leaves drop off without withering. Only the youngest leaves which are abnormally small remain. Afterwards they wither and die without dropping off. Between these extremes there are intermediate forms. In cutting off diseased plants the wood remains connected with the bark. Diseased trees do not show any starch in the roots and stem. The disease can be controlled only by growing resistant types. The disease is mostly present on bearing trees 4–5 or more years old. No organism causing the disease was found.—*J. C. Th. Uphof.*

4408. Weniger, Wanda. **Studies on the causes of stem-end discolorations of potato tube[r]s in North Dakota.** [Abstract.] Phytopathology 13: 55. 1923.

GENERAL AND MISCELLANEOUS PATHOLOGICAL LITERATURE

4409. Anonymous. **Verslag over het jaar 1919 van het Departement van den Landbouw in Suriname.** [Report for the year 1919, Department of Agriculture, Surinam.] *78 p.* Paramaribo, 1919.—Reports of the different experiment stations and laboratories are contained. Certain districts were much affected by heart-rot of the coconut palm, and the area had probably been infected for 5 years. *Theobroma pentagonum* or Lagarto cocoa showed great immunity against *Marasmius perniciosus* causing witchbrooms. This Theobroma species is more closely related to *T. cacao* than to *T. bicolor* and *T. speciosum*. A 20-acre field planted with *Agave sissalina* produced 463,950 leaves, weighing 232,850 kgm. and yielding 8,755 kgm. of fiber. A report is given on malachra and Sea Island cotton. The native *Elaeis guineensis* suffered much from a heart-rot.—*J. C. Th. Uphof.*

4410. Allen, W. J., and W. LeGay Brereton. **Some suggetions on spray management.** Agric. Gaz. New South Wales 34: 129–134. *3 fig.* 1923.—Practical suggestions are given in the mechanics of spraying relative to waste of material in transport, efficient use of outfit, facilities for mixing, and other factors.—*L. R. Waldron.*

4411. Anderson, O. G., and F. C. Roth. **Insecticides and fungicides, spraying and dusting equipment: a laboratory manual with supplementary text material.** *xvi + 349 p., 71 fig.* John Wiley & Sons: New York, 1923.—"This manual is designed to offer instruction in the preparation of insecticides and fungicides; the construction, selection, testing and operation of spraying and dusting equipment." The material is assembled primarily for collegiate use but with the hope that it will also be useful in vocational schools and in a limited way to those engaged in practical and commercial horticulture. The subject is presented in a simple form so as to be understood by readers with a limited knowledge of chemistry. Stress is laid on the value of spraying as compared with other control measures. In addition to the standard control measures, special ingredients, methods and equipment are discussed with the reasons for rise or decline in their usefulness.—*Lillian C. Cash.*

4412. Bailey, E. M., and R. E. Andrew. **Report on commercial insecticides and fungicides.** Connecticut Agric. Exp. Sta. Bull. 242. *147–165.* 1922.—A report of materials sold as insecticides and fungicides is given, including a total of 95, 80 of which were examined and analyzed in 1922. In the 2nd part recent developments in the use of insecticides are discussed. It is pointed out that arsenate of lead in the dry form is used almost to the exclusion of paste. Nicotine sulphate has come into almost universal use since 1907. The order of combination of spray materials for best results is given.—*Henry Dorsey.*

4413. Blodgett, F. M. **Hot water and hot air treatments of potatoes.** [Abstract.] Phytopathology 13: 55. 1923.

4414. Britton, W. E., M. P. Zappe, and E. M. Stoddard. **Experiments in dusting versus spraying on apples and peaches in Connecticut in 1921.** Connecticut Agric. Exp. Sta. Bull. 235. *208–226. Pl. 17–22, fig. 7–11.* 1922.—Dusting is compared with spraying in 4 apple orchards with 757 trees and in 2 peach orchards with 263 trees. The equivalents of 334 barrels of apples and of 1,715 baskets of peaches were scored. Niagara dusting machines and Friend and Arlington X.L. power sprayers were used. Sulphur-lead dust, sulphur-lead-nicotine dust and Sanders' dust were compared with liquid lime-sulphur, lead aresnate, and nicotine sulphate on apples. In nearly all cases the best apples were secured from the sprayed plots. Both spray and dust controlled coddling moth and chewing insects but the spray was more effective in controlling fungous diseases. On peaches atomic sulphur was used as a spray and was compared with sulphur and sulphur-lime-lead arsenate dusts. The dusted peaches were slightly better. Peach scab and brown rot were controlled by both dust and spray.

Dusting is at present more expensive than spraying in both peach and apple orchards.—*Henry Dorsey.*

4415. Brumpt, E[mile]. **Précis de parasitologie.** *3rd ed., xv + 1216 p., 4 pl. (col.), 736 fig.* Masson et Cie.: Paris, 1922.—The first part of this much enlarged edition is given up to a general discussion of methods of investigation and scientific nomenclature, parasites, relation of parasite with host, adaptation of parasites, and parasitic maladies.—The remainder of the work deals with specific parasites under the following headings: pathogenic protozoa (Spirocheta, Rhizpopoda, Sporozoa, Flagellata, Infusoria); medical helminthology (Trematoda, Cestoda, Nematoda); arthropod parasites (Arachnida, Hemiptera, Diptera); and medical mycology (Hyphomycetes, Ascomycetes, Phycomycetes). The important parasites are discussed as to synonymy, description, habitat, life-history, transmission, and pathology (pathogenesis).—*Frederick V. Rand.*

4416. Doidge, E[thel] M[ary]. **Some common diseases of tomato.** *24 p., 11 fig.* The Specialty Press of South Africa, Ltd.: Johannesburg, Capetown, 192–?.—In a popular manner this book discusses leafspot due to *Septoria Lycopersici* Speg., blossom-end rot attributed to physiological causes, bacterial wilt due to *Bacterium Solanacearum* EFS, late blight or downy mildew caused by *Phytophthora infestans* DeB., early blight due to *Macrosporium Solani* Ell. & Ev., sleepy disease or wilt (*Fusarium* sp.), anthracnose (*Colletotrichum phomoides* (Sacc.) Chester), and fruit rot (*Phoma destructiva* Plowr.). The signs of the disease, a brief description of the organism, and control measures are given.—*Lillian C. Cash.*

4417. Gremaud, Eduard. **Maikrankheit und Dotterblume.** [May disease in bees and the marsh marigold.] Schweiz. Bienenzeitg. **44**: 88. 1923. This is a statement concerning the possibilities of infection of May disease from *Caltha palustris.* The author traces all his trouble in beekeeping to this cause.—*M. G. Dadant.*

4418. Higgins, B. B. **Seed treatment in the control of pepper diseases.** [Abstract.] Phytopathology **13**: 57–58. 1923.

4419. Kotilla, J. E., and G. H. Coons. **Spraying and dusting of potatoes in 1922 at Chatham, Michigan.** [Abstract.] Phytopathology **13**: 54–55. 1923.

4420. Massee, George, and Fred. V. Theobald. **The enemies of the rose. The National Rose Society's handbook on the fungus and insect pests of the rose.** *New ed., 110 p., 8 pl. (col.), 6 fig.* Westminster, S. W., [no date.]—A popular account of the diseases caused by fungi is given by Massee with a description of mildew (*Sphaerotheca pannosa*), black mildew (*Peronospora sparsa*), rust (*Phragmidium subcorticatum*), black spot (*Actinonema Rosae*), leaf-scorch (*Septoria Rosae*), sooty mold (*Fumago* sp.), parasitic rose canker (*Coniothyrium Fuckelii* Sacc.), and chlorosis. In each case preventive measures are given.—The insect enemies are treated by Theobald, who gives in each case a description of the pest, its life history and habits, and remedies to be applied.—*Lillian C. Cash.*

4421. Newell, Wilmon. **Report of the plant commissioner.** Quart. Bull. State Plant Bd. Florida **7**: 75–148. *Fig. 1–2.* 1923.—A general account is given of nursery inspection in Florida, and the activities of the quarantine department.—The sugar cane variety Cayana 10 is mentioned as being highly resistant to mosaic.—Much attention has been given to the eradication of the citrus canker, which occurred in several counties.—*J. C. Th. Uphof.*

4422. North, D. S. **The control of sugar cane diseases.** Australian Sugar Jour. **14**: 687–693. 1923.—This is the 1st of a series of papers on the Australian sugar cane diseases. Australia probably has more serious diseases attacking its cane than any other country. This has been caused by the wholesale, unrestricted importation for 50 years of varieties from abroad without precautionary measures against the introduction of diseases and insect

pests.—Gumming (*Bacterium vascularum* (Cobb) Grieg-Smith), mosaic, red rot (*Colletotrichum falcatum* Went.), and true rust (*Uromyces Kuhnii* Kruger) were introduced with cuttings at an early date. Gumming probably came from Brazil and Mauritius. The Fiji disease (cause unknown), leaf stripe (*Sclerospora Sacchari* Miy.), and leaf scald (*Bacterium* sp.) are suspected of being importations from New Guinea. Besides these better known diseases, cane has been severely affected from time to time by top rot (cause unknown), curly top (cause unknown), knife cut (cause unknown), and certain root and leaf diseases not yet thoroughly investigated. Many minor diseases of leaf, leaf sheath, stem, and root also occur, introduced doubtless with cuttings, largely from New Guinea. It is believed that almost every disease must have been introduced to every cane district. No reason can be given why the Fiji disease has never become established at the Colonial Sugar Refining Company's Queensland mills, while it has been for so long a time highly destructive at the New South Wales mills and in Fiji; or why leaf stripe has not been found in New South Wales or the Childers district, while prevalent at Mackay and all the districts to the north and in Fiji.—Sometimes a disease has been eradicated by the introduction of an immune variety of cane. Thus, the gumming disease which devastated the crops of nearly every mill, has now apparently disappeared from Harwood and Condong, and it has not been heard of from Fiji for several years. On the other hand, gumming is increasing at the Broadwater, Victoria, and Macknade mills, is reappearing at Childers and in scattered small areas elsewhere.—Finding a disease-resistant variety of cane is not the only nor always the best way of combatting a disease of cane. With the new varieties come new diseases. A sugar cane, if properly cared for, can be propagated by cuttings for 150 years and probably longer without degeneration; for example, Lehaina, which is still the chief variety of irrigated plantations on the Hawaiian Islands. It is susceptible to diseases, and was eliminated from cultivation for this reason; but after the diseases in question had disappeared it was reestablished as the standard cane. Similarly, Badilia was attacked by the Fiji disease; but with the control of this disease it has continued to be cultivated. Badilia has been introduced into Australia in the place of superior varieties of cane because it is considered highly resistant to diseases. However, it is not universally immune, for it is too susceptible to gumming for planting at Broadwater, and it is somewhat susceptible to mosaic, leaf stripe, and leaf scald.—*Caroline Rumbold.*

4423. [O]ortwijn, Botjes, J., and H. M. Quanjer. **Dutch potato varieties resistant to wart disease and internal brown spot.** [Abstract.] Phytopathology **13**: 54. 1923.

4424. Osmum, A. V., and P. J. Anderson. **An improved formaldehyde tank for the onion drill.** [Abstract.] Phytopathology **13**: 58. 1923.

4425. Peyronel, B. Come avviene e come si previene la diffusione delle malattie crittogamiche delle piante. [The dispersion of cryptogamic parasites and means of control.] Boll. Mens. R. Staz. Patol. Veg. [Rome] **2**: 119–124. 1921; **3**: 3–20. 1922.—This is an extensive review of the literature, without bibliographic citations. The subject is discussed under the following heads: spread from plant to plant in a specific locality, dissemination by means of water, by wind, by animals, and in or upon the tissues of the host.—*D. Reddick.*

4426. Ramsay, A. A. **A home-made tobacco wash for combined sprays.** Agric. Gaz. New South Wales **34**: 58–60. 1923.—Home-made tobacco wash, made by extracting waste tobacco with boiling water, is unsatisfactory when used combined with such a spray as lime-sulphur because of flocculent precipitations. This trouble has been avoided by extracting the tobacco waste in the cold with lime water and then straining. The cost of the preparation is given.—A treble-purpose spray comprising lead arsenate, home-made tobacco wash, and lime-sulphur has been found efficient with no significant increase in amount of soluble arsenic.—*L. R. Waldron.*

4427. Ramsay, A. A. **Storage experiments with lime intended for sprays. Results for the completed period of trial.** Agric. Gaz. New South Wales **34**: 69–70. 1923.—Freshly

slaked lime stored under water for a period of 1 year underwent practically no deterioration, the increase of calcium carbonate being only 0.8 per cent.—*L. R. Waldron.*

4428. Reddick, Donald. **Ito's potato variety Ekishirazu in New York.** [Abstract.] Phytopathology 13: 55–56. 1923.—The variety is resistant to *Phytophthora infestans* but susceptible to mosaic.—*F. V. Rand.*

4429. Samuel, Geoffrey. **Notes on forest pathology from South Australia.** Australian Forest Jour. 5: 189–192, 223–226, 253–254. *7 fig.* 1922.—The economic importance of tree diseases is emphasized. The present pathological condition of the South Australian pine forests is discussed under the following headings: (1) general observations on growth, (2) "curly needle" disease, and (3) fungus diseases. Experiments were carried out to test the parasitism of *Sphaeropsis* and *Pestalozzia* sp. on *Pinus insignis*. These organisms were found not to be responsible for the disease under consideration. The abnormal types of growth are believed to be due to physiological causes. *Armillaria mellea* is mentioned as a root rot.—*C. F. Korstian.*

4430. Schneiderhan, F. J. **Scab and other things.** Proc. Virginia State Hort. Soc. 1922: 153–174. 1923.—An analysis of representative lots of cull apples at Winchester, Virginia, showed the cause of culling to be as follows: 53.9 per cent due to fungous diseases, 25.7 per cent to insect pests, and 20.4 per cent to other factors. Scab (*Venturia inaequalis*) was the most important single factor, 30.9 per cent being culled from this cause. A survey of spraying practices indicated that orchards in general are insufficiently equipped for satisfactory work and that the number of spray applications made is insufficient for satisfactory control of diseases and insects. The pink application was found to be of greatest value in scab control. The calculated values of the 4 early-season applications in scab control are as follows: delayed dormant, 3; pink, 41; calyx, 33; 2-weeks, 12.—*F. D. Fromme.*

4431. Smith, Ralph E., and Joseph P. Martin. **A self-mixing dusting machine for applying dry insecticides and fungicides.** California Agric. Exp. Sta. Bull. 357. *497–505. Fig. 1–3.* 1923.—It should not be assumed that the use of this machine will entirely take the place of factory-mixed dust. The idea at present applies only to a large power machine and is impracticable where hand machines are employed, or in any small scale work. Furthermore, many growers prefer ready-made material to anything which requires accurate measurement and mixing of materials in the field. The self-mixing machine, by increasing the practise of dusting, promises to supplement and extend the use of ready-made mixtures rather than to supplant or lessen their use.—*A. R. C. Haas.*

4432. South, F. W. **Regulations controlling the importation of plants into the Straits Settlements, the Federated Malay States and Johore.** Malayan Agric. Jour. 10: 228–233. 1922.—This constitutes an exact statement of the rules controlling the importation of plants in force on Oct. 31, 1922.—*I. H. Burkill.*

4433. Stearns, L. A., and W. S. Hough. **Spreader tests on apples and peaches.** Proc. Virginia State Hort. Soc. 1922: 55–59. 1923.—Casein and flour-paste spreaders did not increase the efficiency of spray mixtures in the control of fungous diseases and insect pests of apple and peach. The spray mixtures employed were lime-sulphur for the early applications on apple, and Bordeaux mixture for the late applications. Atomic sulphur was used on peaches.—*F. D. Fromme.*

4434. Stuart, William. **The potato: its culture, uses, history and classification.** *ix + 518 p., frontispiece + 267 fig.* J. B. Lippincott: Philadelphia and London, 1923.—Of this monographic work 101 pages are devoted to potato diseases and their control; insect and animal parasites of the potato and methods of controlling them; fungicides and insecticides, their preparation, use, application, and resultant benefits; spray equipment and classifi-

cation.—Classification and treatment of the parasitic and non-parasitic diseases are first given in tabular form. This tabulation is followed by a discussion of each specific disease, including such data as distribution, symptoms, methods of infection, source of infection, preventive measures and their results, etc. In this manner the main facts are given concerning 17 parasitic and 5 non-parasitic diseases of the potato and their control.—Insect parasites of the potato are treated under (1) leaf-chewing and mining insects; (2) stem- and tuber-eating insects; and (3) sucking insects. Following a tabulation of some 14 of these insects (and the eelworm) with control measures, each is brought under detailed discussion.—The chapter following gives a classification of fungicides and insecticides, with detailed descriptions, and directions for mixture and use.—*Frederick V. Rand.*

4435. Tisdale, W. B. **Tobacco diseases in Gadsden County in 1922.** Florida Agric. Exp. Sta. Bull. 166. *77–118. Fig. 14–28.* 1922.—A description is given of tobacco diseases in Gadsden County, Florida. The common practice in Florida of covering the plant beds with cloth protects the seedlings from insects and no doubt prevents mosaic infection. Most growers also cut the stalks as soon as they have finished priming, which reduces the number of infected plants for insects to feed on. Clearing out the edges of shades, as is practiced by some growers, destroys insects and the source of mosaic infection.—Root-knot is the cause of serious damage; badly infested plants may be entirely killed, especially during the dry season. Except in badly infested areas there is only a slight amount of dwarfing and the yield is but little reduced. Infested fields usually show irregular growth of plants. Wildfire caused by *Bacterium tabacum* Wolf & Foster was reported in Florida in 1921; it spreads rapidly from leaf to leaf. The age of the plant and the weather conditions modify the appearance of the spots. It usually makes its appearance in the plant bed before the plants are ready for transplanting. During rains the wildfire germs are washed out of the diseased tissues of the host plant and are splashed on healthy leaves above and on nearby healthy plants. For control the seedbed should be disinfected before planting. Tobacco seed can be conveniently disinfected by tying loosely in a muslin bag and immersing for 10 minutes in a solution (1–1000) of corrosive sublimate or formaldehyde (1 fluid ounce to 1 pint of water). Used cloth over the beds should be avoided. The plants should be sprayed with 4–4–50 Bordeaux mixture or a dust, such as that of Sanders.—Granville wilt caused by *Bacterium Solanacearum* E. F. S. is very serious. None of the tobacco strains showed any promising degree of resistance. Leafspot caused by *Phyllosticta Nicotianae* E. & E. is very limited in distribution and of minor importance. Specking, due probably to *Cercospora Nicotianae* E. & E. was very prevalent in 1922, but in fields where the leaves could be primed early the crop suffered very little damage; where rains delayed priming it caused considerable loss. It does not occur on vigorous, rapidly growing plants. Whenever growth is checked the disease appears on the lower leaves and advances upwards. The variety Big Cuba is recommended for planting.—Root-rot caused by *Thielavia basicola* (B. & Br.) Zopf. is found in the shaded tobacco fields of Florida and was widespread in 1922. Connecticut Round Tip is highly resistant, while Big Cuba is susceptible. The difference in growth of Big Cuba plants in badly infested fields indicates a difference in degree of resistance between individual plants. A few growers have started selection for resistance.—Black Shank, very likely caused by *Phytophthora Nicotianae* de Haan, has appeared in recent years and is very serious. The varieties Connecticut Round Tip and White Burley are most susceptible. No definite and practical method of control is offered. In Gadsden County the grower moves to new fields. Experimental steaming of several acres of land has demonstrated that the organism can be eradicated from the soil but this method is too expensive to be practical.—*J. C. Th. Uphof.*

4436. Tisdale, W. H., and J. W. Taylor. **Organic mercury seed disinfectants.** [Abstract.] Phytopathology **13**: 38. 1923.

4437. Young, H. C. **Sulphur as a fungicide. I. Colloidal sulphur.** [Abstract.] Phytopathology **13**: 60. 1923.

PHARMACEUTICAL BOTANY AND PHARMACOGNOSY

H. W. Youngken, *Editor*

E. N. Gathercoal, *Assistant Editor*

(See also in this issue Entries 3663, 3782, 3791, 4113, 4215, 4489, 4490)

4438. Anonymous. **Nos plantes médicinales de France. [Medicinal plants of France.]** *8 pl.* Comité Interministeriel des Plantes Médicinales et à Essences: Paris, 1923.—The following plants and their floral and fruiting parts are depicted in colors: *Sarothamnus scoparius* Koch., *Aconitum napellus* L., *Papaver rhoeas* L., *Viola odorata* L., *Bryonia dioica* Jacq., *Digitalis purpurea* L., *Solanum dulcamara* L., and *Sambucus nigra* L. Accompanying each of the plates is an account of the synonyms, parts used, description of plant, time of flowering, collection, preparations, properties, and uses.—*H. W. Youngken.*

4439. Annett, H. E., and M. N. Bose. **Studies in the meconic acid content of Indian opium.** Mem. Dept. Agric. India Chem. Ser. 6: 215–221. 1922.—It would seem that the physiological process whereby alkaloids are produced in the opium poppy produces meconic acid in amount equivalent to the alkaloids.—*J. Sen.*

4440. Aston, B. C. **The poisonous, suspected, and medicinal plants of New Zealand.** New Zealand Jour. Agric. 26: 78–79. 1923.—Members of the Leguminosae, Rosaceae, Saxifrageae, Myrtaceae, Passifloreae, Umbelliferae, Rubiaceae, and Compositae are discussed.—*N. J. Giddings.*

4441. Balfour, Andrew. **Oil of Chenopodium [and] cultivation of Chenopodium plant.** In: Report on Medical and Sanitary Matters in Mauritius, 1921, *22 p.* Waterlow & Sons Ltd.: London, 1922.—*Chenopodium ambrosioides* var. *anthelminticum* is generally regarded as the most satisfactory vermifuge in ankylostomiasis. It grows plentifully in Mauritius, where it is known as Botrys. Yields of oil from local plants proved low. The native plant is being placed under cultivation and high-class seed from the U. S. A. is being secured. Soil and climate appear to be well suited to successful cultivation of the plant.—*J. R. Schramm.*

4442. Black, O. F., W. W. Eggleston, J. W. Kelly, and H. C. Turner. **Poisonous properties of Bikukulla cucullaria (dutchman's breeches) and B. canadensis (squirrel corn).** Jour. Agric. Res. 23: 69–78. *Pl. 1.* 1923.—*Bicuculla cucullaria* and *B. canadensis* have been considered poisonous to cattle in Virginia, which is confirmed for the former by preliminary feeding experiments on yearling steers. Chemical examination shows that the tops and roots of both species contain toxic alkaloids. Dilutions of the total alkaloids were subcutaneously injected into mice, with the result that it is estimated that *B. cucullaria* is about 6 times as toxic as *B. canadensis.* A highly poisonous and heretofore apparently unknown alkaloid, cucullarine, was found in *B. cucullaria;* its properties are described.—*W. C. Muenscher.*

4443. Cary, C. A. **Poisonous action of red buckeye on horses, mules, cattle, hogs, and fish.** Alabama Agric. Exp. Sta. Bull. 218. *20 p.* 1922.—A description of *Aesculus pavia* L. and a report of tests on the effects of different parts of this plant on several animals are presented. While pigs, mules, cattle, and fish exhibited some symptoms of poisoning when fed parts of the plant, none were killed or permanently injured.—*W. A. Gardner.*

4444. Chauvin, E. **Sur la toxicité de Volvaria gloïocephala DC. [On the toxicity of Volvaria gloiocephala.]** Compt. Rend. Acad. Sci. Paris 175: 1231–1233. 1922.—This species was considered deadly until recently, when Gautier reported it not toxic in Algeria. The author tested specimens, collected in France, on dogs, guinea pigs, and on himself, with no ill effects. He hesitates to declare it entirely non toxic, as individuals differ in susceptibility, and specimens are liable to differ according to the soil upon which they grow. *Amanita junquilla* proved slightly toxic at certain seasons.—*C. H. Farr.*

4445. Dalmier, E., et Oliveau. Trois cas simultanés di empoisonnement grave par Amanita pantherina. [Three cases of severe poisoning by Amanita pantherina.] Bull. Trimest. Soc. Mycol. France 38: 100–105. 1922.—Typical muscarine poisoning of the cerebral type has been caused by eating *Amanita pantherina* mixed with harmless mushrooms.—*D. S. Welch.*

4446. Greenish, Henry G. Microscopical examination of foods and drugs. 3rd ed., *xx + 389 p., 209 fig.* P. Blakiston's Son & Co.: Philadelphia, 1923.—The subject matter of this book is divided into 15 sections and 2 appendices in which the following topics are considered: starches, hairs and textile fibers, spores and glands, ergot, woods, stems, leaves, flowers, barks, seeds, fruits, rhizomes, roots, adulterants of powdered foods and drugs, general scheme for the examination of powders, reagents of general utility, and varieties of cell walls and cell contents and their identification. Several new methods of microtechnique have been introduced, including a process for the disintegration of tissues by maceration with chromic and nitric acids.—*H. W. Youngken.*

4447. Nelson, J. C. The bracken as a poisonous plant. Amer. Fern. Jour. 12: 125–127. 1922.—*Pteridium aquilinum* (L.) Kuhn. var. *pubescens*, a weed in the Northwest, has been found poisonous to horses. The poisonous property seems to be due to a "fixed oil, insoluble in water," which is found in many ferns. The eradication of the fern seems impossible due to its deep-seated and drought-resistant rhizome.—*F. C. Anderson.*

4448. Offner, J. Empoisonnement par des champignons secs. [Poisoning by dried fungi.] Bull. Trimest. Soc. Mycol. France 38: 106–108. 1922.—There have been many cases of poisoning from eating mushrooms preserved by drying. It is suggested that a strict supervision should be placed on the industry of collecting and drying of fungi for market.—*D. S. Welch.*

4449. Tanert, G. Seigle ergoté falsifié. [Adulterated ergot.] Répertoire Pharm. 35: 69–71. 1923.—About 17 per cent of the samples of ergot sold as coming from Sapin consisted of black grains with a grayish-yellow fractured surface. The taste of the article was farinaceous, and the adulterant sank in water. The adulterant consisted of masses of wheat starch paste passed through narrow apertures, and after being broken into suitable lengths, the fragments were colored by immersion, first in red and then in black ink.—*H. W. Youngken.*

4450. Terry, O. P. Treatment of Rhus poisoning. Proc. Indiana Acad. Sci. 1921: 141. 1922.—The article describes a method of using Tincture of grindelia for Rhus poisoning.—*F. C. Anderson.*

4451. Ullmann, A. Ueber Tyramin (p-Oxyphenyläthylamin) als wirksamen Bestandteil der Droge Semina cardui Mariae (Stechdistelkörner). [Tyramine (p-hydroxyphenylethylamine) as the active principle of the drug Semina cardui Mariae (Cardui thistle seeds).] Biochem. Zeitschr. 128: 402–406. 1922.—A detailed description of the method by which tyramine, identified by physiological action and chemical tests, was obtained from seed of the plant in question.—*W. W. Bonns.*

4452. Wallis, T. E. The Lycopodium method of quantitative microscopy. Jour. Roy. Microsc. Soc. London 1920: 169–178. 1920.—In determining the quantity of the elements in an admixture, as of starches, the nature of the substances is first ascertained and a mixture of equal parts of these prepared and a known amount of Lycopodium spores added. Microscopic counts of the three elements are made; then the same quantity of the unknown is mixed with the same amount of *Lycopodium* spores and counts made in the same way. From this the quantity of each of the elements in the unknown is calculated.—*Wm. Randolph Taylor.*

PHYSIOLOGY

B. M. Duggar, *Editor*

W. J. Robbins, *Assistant Editor*

(See also in this issue Entries 3671, 3766, 3794, 3800, 3815, 3825, 3935, 3943, 3967, 4116, 4118, 4122, 4149, 4205, 4239, 4240, 4260, 4288, 4321, 4451, 4612, 4613, 4618, 4619, 4622, 4624)

GENERAL

4453. Handovsky, H. **Leitfaden der Kolloidchemie für Biologen und Mediziner. [Guide to colloid chemistry for biologists and medical students.]** *8 vo., xvi + 206 p., 1 pl., 33 fig.* Theodor Steinkopff: Dresden and Leipzig, 1922.

4454. Onslow, M. W. **Practical plant biochemistry.** *Roy. 8 vo, 2nd ed., vii + 194 p.* University Press: Cambridge, 1923.

4455. Ostwald, Carl Wilhelm Wolfgang. [Translated by Martin H. Fischer]. **An introduction to theoretical and applied colloid chemistry "The world of neglected dimensions."** *2nd ed. (from 8th German ed.) xiii + 266 p., portrait, illus.* John Wiley & Sons: New York, 1922.

PROTOPLASM, MOTILITY

4456. Chibnall, A. C. **A new method for the separate extraction of vacuole and protoplasmic material from leaf cells.** Jour. Biol. Chem. 55: 333–342. 1923.—The method consists in plasmolyzing the fresh leaves with ether or butyl alcohol, pressing out the major part of the vacuole content in a Buchner press, then washing out the remainder with 0.002 NHCl. Spinach leaves were used. The vacuolar fluid thus obtained contains only traces of protein, but does contain quantities of organic and inorganic phosphates. The cell walls are not ruptured by this treatment and the protoplasm, from which some of the water-soluble constituents may have been washed out, is retained in the cells and may be later obtained by grinding with water. It passes into colloidal solution and can be subsequently flocculated by the addition of acid. It is composed of substances soluble in alcohol and ether, together with a complex, the greater part of which is protein.—*G. B. Rigg.*

4457. Weber, Friedl. **Reversible Viskositätserhöhung des lebenden Protoplasmas bei Narkose. [Reversible increase in the viscosity of living protoplasm by narcotic action.]** Ber. Deutsch. Bot. Ges. 40: 212–216. 1922.—Viscosity changes were measured by Weber's method, which makes use of the change in the position of the starch particles, that is, "Verlagerung" of the "statoliths" with centrifuging in conjunction with the particular treatment given. The author finds that the increase in viscosity with the epicotyls of *Phaseolus multiflorus* brought about by ether is considerable. The viscosity increase is reversible with weak ether concentrations, but higher strengths of the narcotic injures the protoplasm.—*F. S. Howlett.*

DIFFUSION, PHYSICO-CHEMICAL PHENOMENA, PERMEABILITY

4458. Girard, Pierre. **Au sujet d'une note de M. L. Lapicque sur le mécanisme des échanges entre la cellule et le milieu ambiant." [Concerning a note by L. Lapicque on the "mechanism for the interchange between the cell and the surrounding medium."]** Compt. Rend. Acad. Sci. Paris 175: 64–65, 1922.—The experiments performed by Lapicque [Compt. Rend. Acad. Sci. Paris 174: 1490] on living algae are reproducible *in vitro*. It is contended that it is impossible to evaluate the osmotic pressure of living cells.—*C. H. Farr.*

4459. Girard, Pierre, W. Mestrezat, et Li-Shou-Houa. **Schéme physique de la perméabilité sélective des cellules vivantes aux différents ions. [A physical scheme of selective permeability of living cells to different ions.]** Compt. Rend. Acad. Sci. Paris 175: 183–185. 1922.—Experiments are made on the selective permeability of anions and cations through

artificial membranes in an attempt to imitate the condition in living cells. It is recognized, however, that the condition in life is less simple than in these experiments, especially in that the intracellular solution is electrolytic and not pure water as in these experiments. $BaCl_2$, BaI_2, and $MgCl_2$ are used severally with HNO_3; and $Ba(NO_3)_2$ is used with trichloroacetic acid. Readings are given as to the number of ion-gm. per l. diffusing in 30–60 minutes.—*C. H. Farr.*

4460. Lapicque, Louis. **Mécanisme des échanges entre la cellule et le milieu ambiant. [The mechanism of interchange between the cell and the surrounding media.]** Compt. Rend. Acad. Sci. Paris **174:** 1490–1492. 1922.—Studies are made on marine algae. In winter the bulb of *Saccorhiza bulbosa* has a salt content much higher than that of the sea water. With *Ectocarpus* it is found that a plasmolyzed cell in a hypertonic solution rapidly recovers its turgidity and finally acquires an osmotic pressure above that of the hypertonic medium. By dark field illumination it is found that the plasma membrane is not inert, but is constantly in a state of Brownian movement. The cell sap is acid and it is found that the protoplasm contracts in an alkaline and swells in an acid solution. Each particle of the protoplasm which is in motion acts as a sponge imbibing material from the external medium and giving it up to the internal. In this way salt is absorbed.—*C. H. Farr.*

4461. Lesage, Pierre. **Expériences pour servir à l'étude du mouvement des liquides dans les massifs cellulaires. [Experiments of service in the study of the movement of liquids through cellular masses.]** Compt. Rend. Acad. Sci. Paris. **175:** 47–50. 1922.—A difficulty is found in comparing the activity of the Dutrochet osmometer with the conduction of liquids from cell to cell. In the osmometer the lower liquid is separated from the solution by an artificial cell. In the experiments reported it is found that with ferrocyanide membranes the exosmosis is less and the evaporation more than with non-ferrocyanide membranes. It is suggested that a study of the structures involved in conduction from cell to cell, such as endodermis, secretory tissue, etc., would be of great importance.—*C. H. Farr.*

4462. Mestrezat, W., Pierre Girard and V. Morax. **Perméabilité ionique élective des éléments cellulaires. [Selective ionic permeability of cells.]** Compt. Rend. Acad. Sci. Paris **174:** 1727–1729. 1922.—It is found that the dissociated molecules do not traverse the membranes in the proportion of chemical equivalents, but that the ions each go in separately, for example the ratio of the absorption of nitate (NO_3) ion to the calcium (Ca) ion may be $\frac{2}{1.02}, \frac{2}{1.32}$ or $\frac{2}{1.04}$. A table of data is given.—*C. H. Farr.*

4463. Newton, Robert, and Ross Aiken Gortner. **A method for estimating hydrophilic colloid content of expressed plant tissue fluids.** Bot. Gaz. **74:** 442–446. *Fig. 1.* 1922.—In a previous paper [Bot. Gaz. **74:** 308–313. 1922] Gortner and Hoffman presented a refractometer method for determining the moisture content of plant saps. The data thus obtained have been applied in the present work. The procedure is as follows: "The freezing point depression of the freshly expressed plant juice is first obtained. Then, having determined the total solids by the refractometric method, a quantity of sucrose just sufficient to make a molar solution in the total water present is added. The freezing point depression is again determined and is usually found to have increased more than the theoretical amount." The method is based on the assumption "that the magnitude of the excess depression is a measure of the quantity of water held in such a way as to be unavailable for the solution of the sugar. The values obtained may be calculated to percentage "bound water." The authors hold that this "bound" water corresponds so regularly with the hydrophilic colloid content that the datum gained is indicative of the amount of such colloid present. Data from actual analyses illustrating the method are given together with formulae to be used.—*B. W. Wells.*

4464. Prat, S. **Plasmolyse und Permeabilität. [Plasmolysis and permeability.]** Biochem. Zeitschr. **128:** 557–567. 1922.—Three species of *Spirogyra* were studied for plasmol-

ysis effects. Univalent ions produced plasmolysis progressing in degree with time. In the case of bivalent ions the effect was either constant, or decreased with time. These results held for both anions and cations. In plasmolytic effectiveness the cations formed the following descending series: K, Na, Ca, Mg; and the anions the series NO_3, Cl, SO_4. An increase of permeability before death was not noted; on the contrary, a reduced permeability was often noted with monovalent ions. It was found that aniline increases the staining of the alga by methylene blue and neutral red.—*W. W. Bonns.*

4465. Romieu, Marc, et Fernand Obaton. **Étude spectroscopique du pigment vert du Chétoptère et de la chlorophylle de l'Ulve.** [A spectroscopic study of the green pigment of Chaetophora and of the chlorophyll of Ulva.] Compt. Rend. Acad. Sci. Paris 175: 51–54. *1 fig.* 1922.—It is concluded that chetopterine is a pigment belonging to the group of the entero-chlorophylls, which it resembles spectroscopically very closely. It is believed to originate from the chlorophyll of the green algae and diatoms which are ingested into the digestive tube, and is not intrinsic with the animal.—*C. H. Farr.*

4466. Stoklasa, J. **Ueber die Resorption des Aluminum-Ions durch das Wurzelsystem der Pflanzen.** [The absorption of aluminum ions by the root systems of plants.] Biochem. Zeitschr. 128: 35–47. 1922.—Experiments with hydrophytes, mesophytes, and xerophytes in water cultures show on analysis that aluminum absorption decreases in these groups in the order named. In hydrophytes the ion is absorbed in relatively large amounts; the greatest quantities were found in roots and underground stems. Absorption was greater from dilute than from concentrated solutions. Within some concentration limits the roots of xerophytes appear impermeable to aluminum. Plasmolysis resulting from excess accumulation of aluminum ions occurs rapidly in xerophytes but more slowly in mesophytes and in hydrophytes only in the more concentrated solutions. The author concludes that aluminum absorption depends upon an exchange of cations. The aluminum ion absorption coincides with loss by the cells of other cations, such as Ca, Mg, or Na.—*W. W. Bonns.*

WATER RELATIONS

4467. Bobilioff, W. **Over de functie van de melksapvaten van Hevea brasiliensis als waterresevoir.** [The function of the latex vessels of Hevea brasiliensis as water reservoirs. Arch. Rubbercult. 5: 367–380. 1921.—Consideration is given to the theory that the latex vessels in *Hevea* serve as reservoirs for water storage. The author decides that this can not be the only function of latex. The changes in the water content of the latex are slight, the concentration remaining nearly constant even during periods of relatively dry weather.—*C. D. La Rue.*

4468. Molisch, Hans. **Ueber den Einfluss der Transpiration auf das Verschwinden der Stärke in den Blättern.** [The influence of transpiration on the disappearance of starch in leaves.] Ber. Deutsch. Bot. Ges. 39: 339–344. *Fig. 1.* 1921.—Excised leaves of *Tropaeolum majus* and other plants, previously exposed to strong sunlight, showed very little starch disappearance during the night period of 8–10 hours, provided the leaves were kept in a dark chamber saturated with moisture. Leaves kept in a dry chamber showed complete starch disappearance by morning. Analysis showed a lower percentage of reducing substances in the latter case. The author points out that the starch disappearance took place under conditions very favorable for rapid transpiration, which he considers very markedly slows down the changing of the starch to some form other than reducing sugars.—*F. S. Howlett.*

4469. Patterson, C. F. **Growth in seedlings of Phaseolus vulgaris in relation to relative humidity and temperature.** Trans. Roy. Canadian Inst. 14: 23–68. 1922.—The author concludes that the influence of relative humidity upon growth in higher plants has been greatly overestimated. Experiments with bean seedlings show that the available moisture in the substratum must be recognized as an important factor, as it may overcome in large measure the harmful effects of low relative humidity and of atmospheres possessing high evaporation coefficients.—*R. B. Thomson.*

MINERAL NUTRIENTS AND SALT RELATIONS

4470. Brioux, Ch. **Assimilabilité comparée du phosphate tricalcique et des phosphates d'alumine et de fer.** [Comparative assimilability of tricalcic phosphate and the phosphates of aluminium and iron.] Compt. Rend. Acad. Sci. Paris 175: 1096–1099. 1922.—Tests were made with 6 types of cultivated plants, each with the 3 kinds of phosphate and a control with no phosphate. On the whole the best results were secured with aluminium phosphate, the tricalcium phosphate being next, and the control last.—*C. H. Farr.*

4471. Coupin, Henri. **Sur l'origine de la carapace siliceuse des diatomées.** [On the origin of the silicious shell of the diatoms.] Compt. Rend. Acad. Sci. Paris 175: 1226–1229. 1922.—The study was made by growing *Nitzschia linearis*, a fresh water species, on Knop's solution with non-nutrient gelatin. No growth was secured without silicon in the nutrient medium, nor was growth obtained with washed sand or colloidal silicon. The diatom grows well on kaolin, pulverized feldspar (orthose), or clay. Potassium and sodium silicate are poisonous. It is concluded that diatoms utilize aluminium silicate in the formation of the shells.—*C. H. Farr.*

4472. Fischer, Wilhelm. **Zur Frage der Kalk Empfindlichkeit unserer Kulturpflanzen und ihrer Behebung durch Kali.** [The question of sensitiveness to calcium of our cultivated plants and its neutralization by potassium.] Landw. Jahrb. 58: 1–53. 1923.—Ehrenberg observed a certain relationship between the calcium and potassium assimilation by plants. The calcium-potassium law shows the relationship between the assimilation of calcium and potassium by plants as indicated by ash analysis; when the calcium content rises, the potassium content is automatically depressed, with the same amount of potassium available to plants, resulting in injury to plant growth. Normal plant growth can again be obtained by an increase in potassium fertilization. The author found this law to apply to lupines and flax, but the results with beets could be applied for and against this law. Different plants possess different degrees of sensitiveness to calcium. This is related, in part, to the soil reaction and phosphorus availability. The author discusses further in detail the relation of calcium to the other common fertilizer constituents in the influence upon the growth of various plants.—*S. A. Waksman.*

4473. Garner, W. W., J. E. McMurtrey, C. W. Bacon, and E. G. Moss. **Sand drown, a chlorosis of tobacco due to magnesium deficiency, and the relation of sulphates and chlorides of potassium to the disease.** Jour. Agric. Res. 23: 27–40. *Pl. 1–7.* 1923.—This chlorosis, prevalent on light sandy soils subject to leaching, resembles potash hunger in beginning at the tips of lower leaves, but the margin of the leaf is not puckered as in that disease. The yellow and green pigments are affected, so that the leaves become very pale yellow or almost white. When cured the formerly chlorotic leaf does not have the correct color; it is light in weight, thin, and inelastic.—The disease is due to magnesium deficiency, as shown by field and laboratory tests with pure chemicals. The ratio of magnesium to soluble sulphates seems to be of prime importance. The deficiency is readily made up by the use of sulphate of potash or of lime which contains some magnesium. One of the values of organic matter of vegetable origin as fertilizer is the continuous supply of magnesium which results from decomposition.—Biochemical studies of tobacco receiving different fertilizer treatments are reported. Potassium sulphate treatments greatly increased the amounts of potassium citrate and malate in the sap. Treatments with the chloride gave no such increases.—The function of Mg, Ca, and S, in a "complete" fertilizer clearly needs to receive consideration along with K, P, and N.—A method of conducting pot cultures in which soil is leached with complete and incomplete nutrient solutions is suggested for use in the study of problems in fertilizer action.—*D. Reddick.*

4474. Leroux, L., et D. Leroux. **Contribution à l'étude de la répartition du fer dans les plantes.** [The distribution of iron in plants.] Rev. Gén. Bot. 35: 24–33, 57–70. 1923.—Chemical determination of the distribution of iron, calcium, and magnesium in the various

parts of plants from a large number of families are reported. The authors conclude that (1) iron represents a slight proportion of the mineral material of plants; in 246 determinations it exceeded 2 per cent, while once it reached 2.97 per cent. (2) The proportion of iron in the ash was very variable, between 0.10 and 2.97, that is to say from 1 to 30 (which corresponds to a variation of 0.003–0.076 per cent or 1:25 based on dry weight). (3) Iron is unequally distributed in the different plant organs. In herbaceous plants the ash of the roots, and after the latter the ash of the flowers, was found to be particularly rich in iron. The leaves were the richest in calcium, and the organs of support (petioles, etc.) in magnesium. In woody plants the ash of the leaves regularly held the most iron. The ash of the organs of support was richest in calcium, and that of the fruits in magnesium. The great amount of iron in the ash from the branches of conifers is worthy of note.—*J. C. Gilman.*

4475. Maquenne, L., and R. Cerighelli. **Influence de la chaux sur le rendement des graines pendant la période germinative. [Influence of calcium on the development of seeds during the period of germination.]** Compt. Rend. Acad. Sci. Paris **174**: 1269–1272. 1922.—The methods previously described by Maquenne and Demoussy were used. The results also agree with those of these authors, namely, that small quantities of calcium, 10 mg. $CaSO_4$ per l., have a favorable action upon the development of organs elaborated during germination, especially upon their increase in length.—*W. K. Farr.*

4476. Maquenne L., et E. Demoussy. **Influence du calcium sur l'utilisation des réserves pendant la germination des grains. [The influence of calcium on the utilization of food reserves during the germination of seed.]** Compt. Rend. Acad. Sci. Paris **175**: 249–252. 1922.—Two steps are distinguished in the germinative process: the analytic phase, in which the substances pass into the soluble form for translocation, and the synthetic phase, in which they pass back into an insoluble form,—such as cellulose, etc. Extracts of pea embryos were tested. A difference was found between those supplied with calcium and those without it. This difference is attributed to an effect of calcium on enzyme action.. The dry weight was slightly greater in the control, and the extracts of cultures showed a slightly different refractive index than did the controls. Examination was also made of wheat, radish and nasturtium, and slight differences found. But it is concluded that calcium is nearly without influence on the transformation of the reserve food in the seed.—*C. H. Farr.*

4477. Vernet, G. **Rôle du chlorure de calcium dans la coagulation du latex d'Hevea brasiliensis. [The rôle of calcium chloride in the coaglation of the latex of Hevea brasiliensis.]** Compt. Rend. Acad. Sci. Paris **175**: 719–721. 1922.—Calcium combines with the soluble phosphates of the latex rendering them less soluble; these remain incorporated in the rubber. The chloride coagulates the albuminoids.—*C. H. Farr.*

PHOTOSYNTHESIS

4478. Boresch, Karl. **Photokatalysen in Pflanzen. [Photocatalysis in plants.]** Naturwissenschaften **10**: 505–512. 1922.—This paper reviews the literature on the manifold photochemical effects on plants. The subjects taken up are: the rôle of mineral catalysors in the plant, the autosensibilization of plant coloring substances, the photolysis of plant pigments, CO_2 assimilation, movements in response to light stimuli as effected by photocatalysis, deleterious light effects, the proportionality laws between the light effect and light absorption, photodynamic effects, and reducing substances. A useful bibliography concludes the article.—*Orton L. Clark.*

4479. Kostytschew, S. **Studien über Photosynthese. 1. Das Verhältnis CO_2/O_2 bei der Kohlensäureassimilation. [Photosynthesis. 1. The ratio CO_2/O_2 in carbon dioxide assimilation.]** Ber. Deutsch. Bot. Ges. **39**: 319–328. 1921.—Leaves exposed to sunlight in CO_2 air showed a high CO_2/O_2 ratio. Continued exposure lowered the ratio to nearly 1, this being especially true for the species of algae worked with. Apparently some of the CO_2 is chemically combined or is in solution with colloidal chlorophyll, since the evidence shows that

practically no CO_2 is held in the intercellular spaces. Respiration and CO_2 assimilation in darkness could not be correlated during the short time of this experiment. It is concluded that the CO_2/O_2 ratio will become practically 1 for any plant after a sufficiently long exposure.—*M. H. Cubbon.*

4480. Kostytschew, S. **Studien über Photosynthese. 2. Wirkt Wundreiz stimulierend auf die Kohlensäureassimilation am Lichte? [Photosynthesis. 2. Does wounding have a stimulating effect on CO_2 assimilation in light?]** Ber. Deutsch. Bot. Ges. 39: 328–333. 1921.—The results secured showed consistently that wounding slightly decreased the assimilation of CO_2. The author concludes that the cell plasma has nothing to do with CO_2 assimilation but that the chloroplasts function instead. The method used is recommended by the author as one suitable for conducting experiments with leaves when the time of exposure is quite long.—*M. H. Cubbon.*

4481. Kostytschew, S. **Studien über Photosynthese. 3. Findet eine Kohlensäureassimilation während der Sommernächte in der subarktischen Region statt? [Photosynthesis. 3. Does CO_2 assimilation occur during the summer night in subarctic regions?]** Ber. Deutsch. Bot. Ges. 39: 334–338. 1921.—CO_2 assimilation remained fairly rapid up to the time the sun set, but no amount of exposure to the strongly diffused light during the night produced noticeable assimilation. The sudden drop was due to a fall in temperature as well as to inability of stomata to open wider. Conifers gave a rather rapid rate of assimilation after sundown. A very small amount of CO_2 was given off during the exposure to strongly diffused light.—*M. H. Cubbon.*

4482. Kostytschew, S. **Studien über Photosynthese. 4. Die CO_2 Assimilation der Leguminosen. [Photosyntheis. IV. CO_2-assimilation by legumes.]** Ber. Deutsch. Bot. Ges. 40: 112–119. 1922.—The main results are as follows: (1) CO_2 assimilation, under conditions of increased CO_2 content, is decidedly higher in legumes than in non-leguminous plants; (2) plants growing in soils rich in nitrates assimilate CO_2 much more rapidly than plants of the same species growing in a nitrate-free soil; (3) in experiments of short duration, nitrates do not increase the number of cc. of CO_2 used per square dm. leaf area per hour; (4) in spite of the presence of root tubercles, species of *Alnus* show the same assimilation rate as plants unable to fix free nitrogen.—*W. C. Muenscher.*

4483. Weinberg, A. von. **Photosynthese (Willstätters neue Assimilationstheorie). [Photosynthesis (Willstätter's new theory of assimilation).]** Ber. Senckenberg. Naturf. Ges. Frankfurt am Main 50: 172. 1920.—A report is given of a lecture on Willstatter's theory of assimilation. The respective parts played by chlorophyll, sunlight, and an enzyme are described, and the conclusion is reached that protoplasm or the enzyme is essential to photosynthesis. Isolated chlorophyll acted upon by light can carry on only the first step in the process.—*A. W. Evans.*

METABOLISM (GENERAL)

4484. Adler, O. **Ueber eine Holzreaction nebst Bemerkungen über das Anethol. [A reaction of wood, with observations on anethol.]** Biochem. Zeitschr. 128: 32–34. 1922.—This is a consideration of the green color produced by immersing wood in a concentrated acetic acid solution of phenylhydrazine hydrochloride and an effort to determine the nature of the reaction by similar color production with known reagents. The conclusion is reached that the wood reaction is due to a derivative of anethol.—*W. W. Bonns.*

4485. Bailey, E. M., Helen C. Cannon, and H. J. Fisher. **The potency of some commercial vitamine preparations as compared with that of dry brewers' yeast.** Connecticut Agric. Exp. Sta. Bull. 240. *3–51.* 1922.—Twenty-two products were partially analyzed chemically and fed to rats; brewers' yeast was used as the control product. In some instances the analyses suggest an explanation of observed impotency of the product in that it has been

diluted or changed by adding various medicaments of established reputation in therapeutics. The feeding test results with rats are given by means of graphs explained by accompanying notes. Yeast Vitamine-Harris tablets, Yeast Vitamine-Harris powder, and Vegex brought the rats to normal weight. The following gave results closely approximating the controls: Cerevisine, Yeast Foam Tablets, Merck's Medicinal Yeast (tablets and powder), and Metagen. Maintenance, or indifferent or inconsistent growth was obtained with Vita Zest, Fleischmann's Yeast, Yeastmine, Vitamon, and Ironized Yeast. The following failed conspicuously in all trials: Magic Yeast, Medic Yeast, Phos-pho Vitamine, Phytamin, Vi-ta-co, Yeastone, and Yeastonic. Yeast Vitamine-Harris powder and tablets, Vegex, and Yeast Foam Tablets were effective in half doses, while Vegex failed in quarter doses. Lower doses than 25 mgm. were not used.—*Henry Dorsey.*

4486. Bergmann, Max. **Über die Bildung der Glucoside.** [On the formation of glucosides.] Naturwissenschaften 10: 838–842. 1922.

4487. Boas, F. **Untersuchungen über die Mitwirkung der Lipoide beim Stoffaustausch der pflanzlichen Zelle. II Mitteilung.** [Studies on the rôle of lipoids in plant cell metabolism, II Contribution.] Biochem. Zeitschr. 129: 144–152. 1922.—The permeability of sapotoxin, choleate, glycocholeate, cholinate and tannocholate of sodium, urethan and quinine hydrochloride was studied with and without NaCl present. Yeast cells were used as permeability indices. Injurious effects of the several reagents are accounted for on the basis of change in the colloidal structure of the cell lipoids, by which permeability is increased to an injurious degree.—*W. W. Bonns.*

4488. Boresch, K. **Ueber die Pigments der Alge Palmellococcus miniatus Chod. var. Porphyrea Wille n. v.** [Pigments of the alga Palmellococcus miniatus Chod. var. porphyrea Wille n. v.] Ber. Deutsch. Bot. Ges. 40: 288–291. 1922.—This reddish brown alga was grown on agar in the absence of other algae. Water extracts of the cell pigment were examined spectroscopically and found to compare very closely with the pigments of many phycoerythrin containing Schizophyceae. This is apparently the first time that "schizophyceae-phycoerythrin" has been described in a member of the Protococcales or outside of the Schizophyceae.—*W. C. Muenscher.*

4489. Braecke, Marie. **Sur la présence d'aucubine et de mélampyrite dans plusieurs espèces de mélampyres.** [On the presence of aucubine and of melampyrite in many species of Melampyrum.] Compt. Rend. Acad. Sci. Paris 175: 990–992. 1922.—*Melampyrum pratense, M. nemorosum,* and *M. cristatum* were studied in particular. Aucubine was found in all and melampyrite in the last 2.—*C. H. Farr.*

4490. Bridel, Marc, et Marie Braecke. **Sur la présence d'aucubine et de saccharose dans les graines de Rhinanthus Crista-Galli L.** [On the presence of aucubine and saccharose in the seed of Rhinanthus Crista-Galli.] Compt. Rend. Acad. Sci. Paris 175: 532–534. 1922.—In addition to the polariscopic tests, a study was made of the action of emulsin and invertin. Both aucubine and saccharose were found in the pure state.—*C. H. Farr.*

4491. Cannon, Paul R., and B. W. McNease. **Factors controlling intestinal bacteria. The influence of hydrogen-ion concentration on bacterial types.** Jour. Infect. Diseases 32: 175–180. 1923.—The higher acidity of the contents of the intestine resulting from carbohydrate as contrasted with protein feeding was correlated with a simplification of the intestinal flora, *B. acidophilus* predominating under the more acid conditions.—*R. L. Starkey.*

4492. Colin, H., et H. Belval. **La genèse des hydrates de carbone dans le blé. Présence de lévulosanes dans la tige.** [The origin of carbohydrates in wheat. The presence of the levulosanes in the stem.] Compt. Rend. Acad. Sci. Paris 175: 1441–1443. 1922.—In the leaves of wheat the only soluble carbohydrates present are saccharose and the products of

its hydrolysis. An analysis is made of the leaves and stems of wheat on 5 dates from May 18 to July 1, material being collected at 4 o'clock in the afternoon. Records were obtained for the total sugar content, the reducing sugars, saccharose, the levulosanes, and the dextrose-levulose ratio. It is found that the levulosanes do not appear until the latter part of this period. The reducing sugars reach a maximum in the stem near the middle of the period and saccharose shows a gradual increase to the end.—*C. H. Farr.*

4493. Combes, Raoul, et Denise Kohler. **Ce que deviennent les hydrates de carbone quand meurent les feuilles des arbres.** [The destination of the carbohydrates when the leaves of trees die.] Compt. Rend. Acad. Sci. Paris 175: 590–592. 1922.—This is a continuation of the study previously reported [Compt. Rend. Acad. Sci. Paris 175: 406], using *Fagus silvatica* and *Aesculus Hippocastanum*. Analyses were made of the leaves at the beginning of the yellowing period and after the leaves had turned brown. Between these dates some of the leaves used remained on the tree, and others were picked and kept under similar conditions. It was found that the soluble carbohydrates decrease during yellowing to a greater extent in the attached leaves. It is also found that in such leaves the hydrolyzable, insoluble carbohydrates increase during yellowing to a greater extent. About 45 per cent of the carbohydrate remains in the leaf during yellowing; about 35 per cent is lost in respiration and washing by rain; and about 20 per cent passes back into the stem. It is not believed that the soluble carbohydrates contribute at this time to the hydrolyzable, insoluble carbohydrates.—*C. H. Farr.*

4494. Fulton, John F., Jr. **Animal chlorophyll: its relation to haemoglobin and to other animal pigments.** Quart. Jour. Microsc. Sci. 66: 339–385. 1922.—The present paper aims to show that the pigment responsible for color in certain representative invertebrates comes from the blood stream, and that in many cases the pigment cells of the blood arise (while in circulation) from unpigmented corpuscles. The animal kingdom is discussed as 2 groups, those without a blood-vascular system and those with such a system. Through the animal kingdom the strong relationship between the body pigments and chlorophyll is shown and the author concludes that there is strong evidence that the respiratory pigment haemoglobin is derived both phylogenetically and physiologically from chlorophyll. An extensive bibliography is appended.—*C. S. Hoar.*

4495. Gorter, K. **Sur la constitution de la lycorine.** [The constitution of lycorine.] Bull. Jard. Bot. Buitenzorg III, 2: 1–7. 1920.—A structural formula is assigned to this body, previously described and the properties of several derivatives are defined.—*C. C. Epling.*

4496. Gorter, K. **Sur la distribution de la lycorine dans la famille des Amaryllidacées.** [The distribution of lycorine in the Amaryllidaceae.] Bull. Jard. Bot. Buitenzorg III, 1: 352–358; 2: 331–334. 1919–20.—Lycorine, first isolated from *Lycoris radiata* Herb., has since been reported from 13 genera of the family. Negative results are reported in the case of *Pancratium, Hippeastrum,* and *Polianthes.*—*C. C. Epling.*

4497. Gorter, K. **Sur l'hyptolide, principe amer d'Hyptis pectinata Poit.** [Hyptolide, the bitter principle of Hyptis pectinata.] Bull. Jard. Bot. Buitenzorg III, 1: 327–337. 1919.—A lactone obtained from *Hyptis pectinata* Poit. is described and a formula is assigned.—*C. C. Epling.*

4498. Greiner, I. **Ueber die Bestimmung kleiner Zuckermengen nach den Bertrandschen Verfahren.** [The determination of small amounts of sugar by the Bertrand method.] Biochem. Zeitschr. 128: 274–278. *1 fig.* 1922.—There is given an outline of the method of procedure, with a table of copper equivalents of sugar.—*W. W. Bonns.*

4499. Heller, V. G. **Studies on yeast. V. The vitamin B content of yeast.** Jour. Biol. Chem. 55: 385–398. 1923.—The vitamin B potency of yeast (*Saccharomyces cerevisiae*

[Race F]) for rats has been determined. Drying the yeast destroys some of its vitamin. This yeast when grown on a synthetic medium is not as rich in vitamin B as when grown on wort. This yeast synthesizes not only the growth-promoting vitamin, but the antineuritic vitamin as well.—*G. B. Rigg.*

4500. Jonesco, St. **Les pigments anthocyaniques et les phlobatanins chez les végétaux.** [The anthocyanic pigments and the phlobatannins of plants.] Compt. Rend. Acad. Sci. Paris **175:** 904–907. 1922.—A study is made of the pigments of the red leaves of *Prunus Pissardi*. It is concluded that the phlobatannins are not the same as the pseudo-bases of Kurt Noach. The so-called anthocyans are regarded as of 3 different kinds: (1) the anthocyanins of Willstätter, which are red, blue, or violet, and which do not fade with amyl alcohol; (2) the anthocyanidines, red in color, existing in a free state in the tissues, and fading readily with amyl alcohol; (3) the leuco-anthocyanidines or pseudo-bases, which are yellow, fading with amyl alcohol, and passing over into anthocyanidines upon heating with hydrochloric acid.—*C. H. Farr.*

4501. Jonesco, St. **Sur la répartition des anthocyanidines dans les organes colorés des plants.** [The distribution of the anthocyanidines in the pigmented parts of plants.] Compt. Rend. Acad. Sci. Paris **174:** 1635–1637. 1922.—Rosenheim reported anthocyanidines in the free state in leaves of *Vitis vinifera* in 1920, and independently Jonesco discovered them in fruits, leaves, and flowers of other plants. Since then, attempts have been made to find them in plant organs colored red, violet, or blue. Red leaves of *Ampelopsis*, reddish violet leaves of beet, red stems of *Sarrasin argente*, violet flowers of gladioli and *Cobaea scandens*, reddish purple flowers of *Canna* and rose and blue flowers of *Centaurea cyanus* were studied. Anthocyanidines were found in *Ampelopsis* and *Sarrasin*, but in the other 6 forms a yellowish pigment was present in addition to anthocyan. It is concluded that anthocyanidines do not always accompany anthocyans, but are especially characteristic of red organs.—*C. H. Farr.*

4502. Kolkwitz, R. **Ueber das Schicksal des Chlorophylls bei der herbstlichen Laubverfärbung.** [The fate of chlorophyll in autumnal leaf coloration.] Ber. Deutsch. Bot. Ges. **37:** 2–5. 1919.—It has been held by some that autumnal leaf coloration is due to the withdrawal of certain components of chlorophyll from the leaf to the perennial plant parts in order to economize compounds of M, P, and C. The author reports observations and experiments which are interpreted as indicating that this is not the case. He calculates, from data of Willstätter and Stoll, that the N content of chlorophyll *a* and *b* is only about 0.05 per cent of the dry matter of leaves.—*W. C. Muenscher.*

4503. Kostytschew, S. **Ueber die Ernährung der grünen Halbsschmarotzer.** [Nutrition of green semi-parasites.] Ber. Deutsch. Bot. Ges. **40:** 273–279. 1922.—The author discusses previous work done on the nutrition of green semi-parasites. The following species used in the experiments reported in this paper: *Electorolophus major*, *Melampyrum pratense*, *Pedicularis* spp., *Euphrasia* spp., and *Odontites rubra*, all belonging to the Rhinantheae under Schophulariaceae. Experiments show that, in general, there is no difference in the CO_2 assimilation rate between turgid cuttings of these species and autotrophic species of the same family. The transpiration rate in these semi-parasites is markedly increased when the roots are removed under water. The author believes that the initial cause for the beginning of parasitism in semi-parasites is the inability of the roots to supply water lost by transpiration so that the plants obtain water through root haustoria from the host, which necessitates the transfer of organic materials into the roots of the semi-parasite. Later this condition may influence the development of the leaf structure and chlorophyll apparatus to such an extent that parasitism may result. The Rhinantheae have only taken the first step toward a parasitic mode of living; they show a reduction of the root system but not of the chlorophyll apparatus.—*W. C. Muenscher.*

4504. Kritchevsky, I. L., and A. L. Douchowsky. **Structure of complement.** Jour. Infect. Diseases **32:** 187–191. 1923.—The sap of *Cotyledon Scheideckeri* inactivated complement. Absorption of the complement by the precipitate and not decomposition seemed to occur.—*R. L. Starkey.*

4505. Metzner, P. **Ueber den Farbstoff der grünen Bacterien.** [Pigments of green bacteria.] Ber. Deutsch. Bot. Ges. **40:** 125–129. *Fig. 1.* 1922.—The author discusses the literature dealing with the pigments found in such green bacteria as *Bacterium viride, B. chlorinum, Bacillus virens,* and *Streptococcus varians.* In some prelminary experiments the author examined spectroscopically alcoholic extracts of the green pigments obtained from dried masses of green bacteria free from algae. It is concluded that this green pigment which he tentatively calls "bacterioviridin" is not identical with the chlorophyll of the higher plants.—*W. C. Muenscher.*

4506. Mirande, Marcel. **Sur la relation existant entre l'acidité relative des tissus et la présence de l'anthocyanine dans les écailles de bulbes de lis exposées à la lumière.** [The relation existing between the relative acidity of the tissues and the presence of anthocyanin in the scales of the lily bulb exposed to light.] Compt. Rend. Acad. Sci. Paris **175:** 711–713. 1922.—Leaves detached and exposed to light show an increase in acidity due to wounding and an increase also correlated with pigmentation. In darkness only the first increment is obtained. Acidity of leaves attached, 1.134 cc.; detached, in light, 1.876 cc.; detached, in dark, 1.622 cc. Readings are in cc. of a solution of phenolphthalein and KOH per gm. of fresh weight. It is thus concluded that oxidation occurs in anthocyan synthesis.—*C. H. Farr.*

4507. Robertson, R. C., and D. J. Davis. **Food accessory factors (vitamins) in bacterial growth. Observations on the ultimate source of accessory growth substances for yeast VII.** Jour. Infect. Diseases **32:** 153–158. 1923.—It was observed that while yeast was incapable of giving continued growth upon a synthetic medium, the addition of extracts of beef heart, carrot, potato, and yeast produced a luxuriant and continuous growth. The optimum concentration of the extracts was found to be about 1: 500. The further point was made that these extracts alone will not permit continuous growth, and that the ultimate origin of the seemingly necessary growth stimulating substances is still unknown. The quality of continuity of growth was tested by transplants upon dextrose agar at intervals of 24 hours.—*R. V. Allison.*

4508. Terroine, Émile-F., R. Wurmser, et J. Montané. **Influence de la constitution des milieux nutritifs sur la composition de l'Aspergillus niger.** [The influence of the constitution of the nutritive media on the composition of Aspergillus niger.] Compt. Rend. Acad. Sci. Paris **175:** 541–544. 1922.—This is a continuation of earlier work [Compt. Rend. Acad. Sci. Paris **175:** 228]. A study is made of the effect of stage of development, concentration of $(NH_4)_2SO_4$, concentration of carbohydrate, kind of nitrogenous compounds used, kind of carbohydrate, and the influence of starvation. It is found that reserve nitrogen is absent in the presence of high concentrations of ammonium compounds, that ternary substances accumulate in the presence of high concentrations of carbohydrates, and that proteins are consumed in starvation. All data show the correspondence between the physiology of *Aspergillus* and that of the higher animals.—*C. H. Farr.*

4509. Weber, U. **Beitrag zur Kenntnis der esterbildenden Hefen.** [The ester forming yeasts.] Biochem. Zeitschr. **129:** 208–218. 1922.—Four yeasts and and 2 imperfect fungi were studied for growth, fermentation power, and ester formation, determining the latter by the strength of the resulting odor. Considerable variation in reactions was noted. In some cases, as in an atmosphere of CO_2, vigorous growth was accompanied by no detectable ester formation. Ester formation occurred where carbohydrate fermentation supplied the energy for proteolysis, or when some energy substitute for the carbohydrates was present. The addition of alcohol effected a change in the nature of the ester odor. Nitrogenous nutrients resulted in ester odor changes only with a corresponding change in the amino acids present. When leucine was added to the substrate the odor of amyl ester resulted.—*W. W. Bonns.*

4510. Wille, N. **Phykoerythrin bei den Myxophyceen.** [Phycoerythrin in Myxophyceae.] Ber. Deutsch. Bot. Ges. 40: 188–192. *Fig. 1.* 1922.—The author reviews the work, especially that of Boresch, dealing with the occurrence of phycoerythrin in the Myxophyceae. The author calls attention to an unpublished note written by him in 1889, reporting phycoerythrin in *Phormidium persicinum* (Rke.) Gom. The absorption spectra of the phycoerythrin of this Phormidium were identical with those produced by *Rhodymenia palmata* (L.) Grev. The author considers this, along with other conditions, as evidence of the origin of Florideae from the Myxophyceae.—*W. C. Muenscher.*

4511. Ziegenspeck, H. **Amyloid in jugendlichen Pflanzenorganen als vermutliches Zwischenproduckt bei der Bildung von Wandkohlenhydraten.** [Amyloid as an intermediate product in the building of wall carbohydrates in young plant organs.] Ber. Deutsch. Bot. Ges. 37: 273–278. 1919.—The presence of amyloid was demonstrated in young parts of a number of plants. The author points out reasons why it is difficult to find this product in many plants. —*W. C. Muenscher.*

METABOLISM (NITROGEN RELATIONS)

4512. Berg, R. **Die Vitamine: kritische Übersicht der Lehre von den Ergänzungsstoffen.** [The vitamins: critical survey of the accessory growth-promoting substances.] *336 p.* S. Hirzel: Leipzig, 1922.

4513. Blanck, E., W. Geilmann, and F. Giesecke. **Die Stickstoffwirkung des Hexamethylentetramins auf die Pflanzenproduction.** [The effect of nitrogen in the form of hexamethylentetramine upon plant production.] Jour. Landw. 70: 221–251. 1922.—By means of sand and loam pot experiments the effect of hexamethylenetetramine upon plant growth was ascertained. This complex compound is as favorable a source of nitrogen as is $(NH_4)_2SO_4$ as measured by the growth of oats, mustard, and beets. Bacterial activity transforms the organic compound into NH_3 and then into nitrate, a suitable material for the growth of plants. Hexamethylenetetramine is formed by the condensation of NH_3 and HCHO, as well as by the treatment of urea and liquid manure, both of which contain NH_3, with formalin.—*F. M. Schertz.*

4514. Bridel, M., et C. Charaux. **La centauréidine, produit de dédoublement de la centauréine glucoside des racines de Centaurea Jacea L.** [Centaureidine, produced by the splitting of the glucoside centaureine of the roots of Centaurea Jacea.] Compt. Rend. Acad. Sci. Paris 175: 1168–1170. 1922.—In a former paper [see following entry] the method of purification and crystallization of the compounds is presented. This paper gives the determination of its exact chemical composition. The reaction is found to be:

$$\underset{\text{centaureine}}{C_{24}H_{26}O_{13}} + H_2O = \underset{\text{glucose}}{C_6H_{12}O_6} + \underset{\text{centaureidine}}{C_{18}H_{16}O_8}$$

The relative amounts of the products are 34.48 per cent glucose and 68.96 per cent centaureidine. The latter is yellow in color but differs from the flavones in composition, as they are $C_{15}H_{10}O_2$.—*C. H. Farr.*

4515. Bridel, Marc, et Camille Chauraux. **La centauréine, glucoside nouveau, retiré des racines de Centaurea Jacea L.** [The centaureine, a new glucoside, secured from the roots of Centaurea Jacea.] Compt. Rend. Acad. Sci. Paris 175: 833–835. 1922.—The physical and chemical properties of this compound are here given. It contains no N but consists of 50 per cent C and 5 per cent H, and breaks up into CO_2 and H_2O. It hydrolyses into 33.68 per cent glucose and 70.77 per cent centaureidine. It may be obtained in the pure crystalline form.—*C. H. Farr.*

4516. Cohn, E. J. **A physicochemical method of characterizing proteins.** IV. Jour. Biol. Chem. 55: Proc. XLIV–XLV. 1923.

4517. Davidson, Jehiel. **Reduction of nitrates caused by seed as a possible factor in the economy of nitrogen in crop production.** Jour. Amer. Soc. Agron. 14: 338–354. 1922.—Under laboratory conditions, reduction of nitrates is induced by seed. The quantity of seed, the basic radicles of the common nitrates, the concentration of the nitrate solution, and the depth of the liquid in which the seed are submerged did not essentially affect the course of the process within the limits of experimentation by the author. At 50°F. the reduction process was somewhat retarded, otherwise it followed its normal course. Growing seedlings produced a smaller quantity of nitrites than seed which had been rendered incapable of germination by heating or those naturally sterile. Young seedlings induced reduction of nitrates when grown in soil. Actual loss of nitrogen was demonstrated as a result of reduction of nitrates caused by seed.—*F. M. Schertz.*

4518. Fischer, Emil. **Untersuchungen über Aminosäuren, Polypeptide und Proteine II (1907-1919).** Collected works, edited by M. Bergmann. *Sup. Roy. 8 vo, ix + 922 p.* J. Springer: Berlin, 1923.

4519. Prianischnikow, D. **Ueber den Aufbau und Abbau des Asparagins in den Pflanzen.** [Synthesis and decompositions of asparagin in plants.] Ber. Deutsch. Bot. Ges. 40: 242–248. 1922.—The author presents data on asparagin synthesis obtained from experiments with *Lupinus luteus* grown under various conditions of light and carbohydrate supply. The results indicate that the food supply and not the species of the seedlings determines whether an amid (asparagin or glutamin) is synthesized; only when carbohydrates or fats are present, is asparagin synthesized. Otherwise, neither the ammonia supplied externally nor that resulting from respiration can be synthesized into asparagin. It is pointed out that proteins and amino acids of the general formula $R(NH_2)$ COOH, by oxidation and secondary synthesis, are changed to acid amids of the general formula $R(NH_2)$ $CONH_2$ (asparagin and glutamin) and, during starvation, by further oxidation, to ammonia. In the presence of carbohydrates the process is reversed, ammonia is changed to acid amids, which in the presence of additional carbohydrates are built up into amino acids and used in protein synthesis. Ammonia is the first and last step in the change of nitrogenous compounds in plants. Asparagin (or glutamin) is a necessary intermediate product in the synthesis and decomposition of proteins.—*W. C. Muenscher.*

4520. Terroine, Émile F., et René Wurmser. **L'utilisation des substances ternaires dans la croissance de l'Aspergillus niger.** [The utilization of ternary substances in the growth of Aspergillus niger.] Compt. Rend. Acad. Sci. Paris 175: 228–230. 1922.—This is a continuation of work previously reported [Compt. Rend. Acad. Sci. Paris 174: 1435]. The utilization ratio described therein has been determined for 6 different sugars, the source of nitrogen being 0.5 per cent $(NH_4)_2SO_4$; also the utilization ratio with various concentrations of $(NH_4)_2$ SO_4, the sugar being constant—3 per cent glucose; also the utilization ratio with 7 different sources of nitrogen. The ratios for the sugars vary from 46 for levulose to 41 for sucrose, arabinose, and xylose. Among the nitrogen sources HNO_3 gives the highest ratio, 46. Twenty per cent $(NH_4)_2SO_4$ is found to be the best (45) concentration, and 40 per cent the lowest (41). A study is also made of the effect of the acidity of the media in the range pH 1.3–7. It is found that 1.3 is optimum (43) and 5 is minimum (32).—*C. H. Farr.*

4521. Waterman, H. C., C. O. Johns and D. B. Jones. **Conphaseolin. A new globulin from the navy bean, Phaseolus vulgaris.** Jour. Biol. Chem. 55: 93–104. 1923.—A hitherto unknown globulin, differing most conspicuously from phaseolin and phaselin in its much higher sulphur content, has been isolated from the navy bean and named conphaseolin. It contains 10.69 per cent of lysine, the highest per cent of this amino acid that has thus far been found for any vegetable protein.—*G. B. Rigg.*

4522. Winogradksy, S. **Sur la prétendue transformation du ferment nitrique en espèce saprophyte.** [On the supposed transformation of a nitric ferment to a saprophytic species.] Compt. Rend. Acad. Sci. Paris 175: 301–304. 1922.—This is a discussion of the work of the

author's students and of others, especially that of Beijerinck on *Nitrobacter oligotrophum*. Beijerinck maintains that growth and nitration are separate functions, while the author claims that they are inseparable. Chemosynthesis is likely, though not entirely proven for this form.—*C. H. Farr.*

METABOLISM (ENZYMES, FERMENTATION)

4523. Atkins, W. R. G. **The hydrogen ion concentration of the cells of some marine algae.** Jour. Marine Biol. Assoc. United Kingdom [Plymouth] **12**: 785–788. 1922.—The measurements recorded for marine algae of various groups show a sap reaction which in most cases is almost neutral, and in no case of the pronounced acid character met with in many land plants. It follows on evidence previously presented that the enzymes concerned in the metabolism of these algae must differ from those which effect corresponding changes in land plants.—*Marshall A. Howe.*

4524. Bayliss, W. M. **Enzyme als Kolloide.** [**Enzymes as colloids.**] Naturwissenschaften **10**: 983–988. 1922.—This is a general discussion of aspects of enzyme behavior.—*C. C. Epling.*

4525. Chodat, R., et E. Rouge. **Sur la localisation intracellulaire d'une oxydase, et la localisation en général.** [**The intracellular and general localization of an oxydase.**] Compt. Rend. Acad. Sci. Paris **175**: 252–255. 1922.—A statement of the difficulties and problems involved in localizing enzymes in cells is given. A method is described for making such tests using potato as an example. Similar results are reported for *Leucanthemum vulgare*, *Helianthus tuberosus*, and *Stachys tuberifera*.—*C. H. Farr.*

4526. Ehrenberg, R. **Ueber Eiweissenzyme.** [**On protein enzymes.**] Biochem. Zeitschr. **128**: 431–449. 1922.—Dialyzing trypsin and pepsin solutions and preparations of animal tissues, the author found the dialysates to possess enzyme activity.—*W. W. Bonns.*

4527. Funk, E. **Ueber den Einfluss von Kobaltiammoniaken auf die Fermentwirkung der Katalase und Amylase.** [**The effect of cobalt ammoniates on the enzyme action of catalase and amylase.**] Biochem. Zeitschr. **128**: 108–118. 1922.—Amylase and catalase were treated with solutions of hexamminocobaltichloride, xanthocobalt chloride, trinitrotriamminocobaltiate, potassium tetranitrodiamminocobaltiate, and cobalt sodium nitrite. Catalase activity was inhibited and amylase activity accelerated. Inhibition was proportionate to salt concentration even in very dilute solution, but acceleration (for amylase) with increase of concentration was slight. The minimum concentrations effecting increased activity were greater than minimums inhibiting catalase. With the exception of one salt, inhibition was increased by adding phosphates to neutrality.—*W. W. Bonns.*

4528. Furth, O., und F. Lieben. **Ueber Milchsaürezerstörung durch Hefe und durch Blutzellen.** [**The destruction of lactic acid by yeast and by blood cells.**] Biochem. Zeitschr. **128**: 144–168. *1 fig.* 1922.—Yeast as well as blood cells are capable, under favorable conditions, of destroying lactic acid in considerable quantities by oxidation. For yeast such destructive power does not appear to have marked relation to the optical properties of the acid, to temperature, oxygen pressure, or the pressure of a "hydrogen acceptor," but close contact of yeast with oxygen seems a necessary condition. Lactic acid destruction is associated with CO_2 evolution in considerable amounts, of which only a part could be ascribed to loss in sugar. In no case was the greater mass of lactic acid split into CO_2 and H_2O, but was reconverted to sugar. The destructive action of yeast was markedly reduced by acetone or by raising to the boiling point.—*W. W. Bonns.*

4529. Goris, A., et P. Costy. **Sur l'uréase et l'urée chez les champignons.** [**On urease and urea in the fungi.**] Compt. Rend. Acad. Sci. Paris **175**: 998–999. 1922.—Twelve species of Hymenomycetes are compared as to the urease in different parts,—stipe, cap, and hy-

menium. It is present in all parts, being most abundant in the hymenium. Several genera are arranged in descending order of the amount of urease, as follows: *Boletus*, *Clitocybe*, *Trametes*, *Entyloma*, *Russula*, *Lactarius*, *Tricholoma*, *Polyporus*, *Cortinarius*, *Collybia*, *Hydnum*, and *Thelephora*.—*C. H. Farr.*

4530. Goris, A., et P. Costy. **Uréase et urée chez les champignons.** [Urease and urea in the fungi.] Compt. Rend. Acad. Sci. Paris 175: 539–541. 1922.—Goris and Mascre (1908) first reported urea in the higher fungi. Since then they have repeated and extended their observations, employing new methods. It is now concluded that nearly all of the Basidiomycetes and Ascomycetes possess urease. Two hundred species have been tested. A list is given of certain higher fungi with the amount of urea found in each. Many of the species in this list do not contain urease. The amount of urea varies from 0.28 to 9.23 per 1000.—*C. H. Farr.*

4531. Hayduck, F., und H. Haehn. **Das Problem der Zymasebildung in der Hefe.** [The problem of zymase formation in yeast.] Biochem. Zeitschr. 128: 568–605. 1922.—This is a report with detailed experiments. The paper considers the following: (1) the conception of fermentive power in a yeast; (2) formation of zymase in Torula yeasts; (3) zymase formation and nuclein metabolism. The experiments indicate that a yeast of low activity can by proper subjection to free oxygen be developed into one of high growth activity. The question whether enzyme synthesis has been effected or whether only a zymogen activation has been increased, is left open. Marked nuclein metabolism is noted in conjunction with the zymase formation.—*W. W. Bonns.*

4532. Hirsch-Pogany, M. **Liegt der Hitze-Koagulation des Eiweisses eine Hydrolyse zugrunde?** [Is heat coagulation of proteins a hydrolysis?] Biochem. Zeitschr. 128: 396–401. 1922.—Analyses of the dried coagulum obtained after heating egg albumen solutions and of the dried substance in the filtrate, as well as analyses of such solutions evaporated at room temperatures, indicate that any hydrolysis that may occur is too small to be determined by such methods.—*W. W. Bonns.*

4533. Holwerda, B. J. **Ueber den Einfluss der Milchsäure auf die Milchsäuregärung.** [The effect of lactic acid on lactic acid fermentation.] Biochem. Zeitschr. 128: 465–481. 1922.—The author points out the lack of consistency in dissociation constants as previously determined and the causes of the errors and makes a new study of this point by conductivity, also by the electrometric and the colorimetric method of determining H-ion concentration. His results indicate that 1.5×10^{-4} is a proper constant at 25°. A definite concentration of the acid in undissociated form appeared to check lactic fermentation in peptone broth, irrespective of the buffer action of the latter. The dissociation constant was found to vary at different times, which was ascribed to the action of factors unknown rather than to age of culture. Optical modification did not appear to affect physiological action of the lactic molecule; the dextro and laevo forms have practically the same dissociation constant. A *d*-lactic acid-forming bacterium is checked by the lactic acid molecule of either optical characteristic.—*W. W. Bonns.*

4534. Jacoby, M. **Über den Formaldehyd als Übergangsstufe zwischen der eigentlichen Assimilation und der Kohlenhydratbildung in der Pflanze. II Mitteilung.** [Formaldehyde as the intermediate between specific assimilation and carbohydrate formation in the plant. II Contribution.] Biochem. Zeitschr. 128: 119–121. 1922.—Leaves of Tropaeolum majus in an atmosphere of HCHO increased in dry weight over control leaves. This gain occurred both in the presence and absence of O_2. [See also Bot. Absts. 12, Entry 774.]—*W. W. Bonns.*

4535. Jacoby, M. **Ueber künstliche Zymogene. II Mitteilung.** [Artificial zymogens. II Contribution.] Biochem. Zeitschr. 128: 80–88. 1922.—The author, using the Tschugaeff tests for minute quantities of nickel, has determined the effect of this element, both as nickel

powder and as nickel oxide, on urease solutions, in the presence and absence of potassium cyanide. The experiments indicate a reversibility of active and inactive stages.—*W. W. Bonns.*

4536. Jacoby, M., und T. Shimizu. **Ueber die Adsorption von Fermenten und Zymogenen. I. Mitteilung.** [**The adsorption of enzymes and zymogens. I. Contribution.**] Biochem. Zeitschr. 128: 100–102. 1922.—Urease solutions were treated with freshly made $Ca_3(PO_4)_2$, with NaCl, and with Na_2SO_4. The first did not adsorb the enzyme in appreciable amounts, but the latter 2 did so in 10 per cent concentrations. The enzyme inactivated by Ni or Co was likewise adsorbed, and could be reactivated by KCN. Dibasic calcium phosphate adsorbed neither urease nor its inactive form.—*W. W. Bonns.*

4537. Jacoby, M., und T. Shimizu. **Ueber die Adsorption von Fermenten und Zymogenen. II. Mitteilung. Cholesterin-Wirkungen auf die Urease.** [**The adsorption of enzymes and zymogens. II. Contribution. The effect of cholesterin on urease.**] Biochem. Zeitschr. 128: 103–107. 1922.—The addition of small amounts of 10 per cent NaCl and alcoholic cholesterin solutions to 0.3 per cent urease solution had no apparent adsorptive effect. If the mixture is filtered, low activity results in both filtrate and residuum, and combining them again gives even less action. The addition of glycocoll or serum to a filtrate with such reduced activity results in reactivation. No explanation is offered for the results.—*W. W. Bonns.*

4538. Jacoby, M., und T. Shimizu. **Ueber künstliche Zymogene. III Mitteilung. Ueber die Einwirkung von dem Nickel nahestehenden Metallen auf die Sojaurease.** [**Artificial zymogens. III Contribution. The effect of metals close to nickel (in atomic series) on soy bean urease.**] Biochem. Zeitschr. 128: 89–94. 1922.—Ni, Cu, Co, and Zn inactivate urease, but Fe does not. The action of Ni is slower than that of Co, Cu, or Zn, the latter causing strong inactivation even in small quantities. The results appear to support Jacoby's view that the ability of the metals to form compounds with KCN or with amino acids bears on the explanation of their combination with urease and other enzymes to form zymogens.—*W. W. Bonns.*

4539. Jacoby, M., und T. Shimizu. **Ueber künstliche Zymogene. IV Mitteilung. Ueber die Inaktivierung und Reaktivierung der Takadiastase.** [**Artificial zymogens. IV Contribution. The inactivation and reactivation of taka diastase.**] Biochem. Zeitschr. 128: 95–99. 1922.—Taka diastase was not rendered inactive by either Ni, Co, Cu, or Fe. It was inactivated by $HgCl_2$, and reactivated by KCN.—*W. W. Bonns.*

4540. Jonesco, St. **Transformation d'un chromogène des fleurs jaunes de Medicago falcata sous l'action d'une oxydase.** [**Transformation of a chromogen of the yellow flowers of Medicago falcata under the action of an oxydase.**] Compt. Rend. Acad. Sci. Paris 175: 592–595. 1922.—Eleven chemicals are given which may be used in changing the color of the pigment. It is concluded from the tests that the pigment is not a tannin, but a phenol. It is found that it is by oxidation and not by reduction that it is transformed into a violet pigment of anthocyanic nature.—*C. H. Farr.*

4541. Kolkwitz, R. **Ueber den durch Hefegärung entstehenden Druck.** [**Pressure produced by yeast fermentation.**] Ber. Deutsch. Bot. Ges. 39: 219–223. *Fig. 1.* 1921.—An apparatus is described and illustrated whereby the pressure produced by yeast during fermentation can be measured. Fermenting yeast produced pressures as high as 24–40 atm. in 3–4 hours. The author states that normally fermentation by yeast is inhibited at about 12 atm. or less, due to the toxic action of the accumulating CO_2, alcohol, and organic acids, rather than the increased pressure. In the apparatus described a high pressure can be obtained in a relatively short time, before the inhibiting effect of the products of fermentation is produced.—*W. C. Muenscher.*

4542. Koser, Stewart A. **Bacillus Welchii in bread.** Jour. Infect. Diseases 32: 208–219. *Pl. 1.* 1923.—Organisms of the *B. Welchii* type were found in a commercial "starter" used in making salt-rising bread, which organisms were present within the baked loaf in much larger numbers than in ordinary yeast bread. It appears that the Welch bacillus was the active agent in the starter.—*R. L. Starkey.*

4543. Kossel, A. Über physiologische Umformung von Eiweisskörpern. [On the physiological transformation of protein bodies.] Naturwissenschaften 10: 999–1005. *Fig. 1–7.* 1922.—This is a brief general discussion of the subject.—*C. C. Epling.*

4544. Mirande, Marcel. Sur la relation existant entre l'anthocyanine et les oxydases. [Relation existing between anthocyanin and the oxydases.] Compt. Rend. Acad. Sci. Paris 175: 595–597. 1922.—It is found that all of the cells in the scales of bulbs in which anthocyanin is produced in light, and only those cells, contain oxydase. It is demonstrated that O_2 is necessary in the production of anthocyans.—*C. H. Farr.*

4545. Neuberg, C., und J. Hirsch. Zur Klassification der Carboligase. [The classification of carboligase.] Biochem. Zeitschr. 128: 608–609. 1922.

4546. Neuberg, C. und H. Ohle. Zur Kenntnis der Carboligase. IV Mitteilung. Weitere Feststellungen über die biosynthetische Kohlenstoffkettenverknüpfung beim Gärungsvorgänge. [Concerning carboligase. IV Contribution. Further proof of the biosynthetic carbon chain connections in fermentation processes.] Biochem. Zeitschr. 128: 610–618. 1922.

4547. Palladin, W., und H. Popoff. Ueber die Entstehung der Amylase und Maltase in den Pflanzen. [The origin of amylase and maltase in plants.] Biochem. Zeitschr. 128: 487–494. 1922.—A condensed review of previous work on these plant enzymes and a brief description of the authors' experiments with abcissed leaves, green and etiolated, of *Robinia*, *Platanus*, and *Ricinus* is given. Such material, subjected to autolysis at high summer temperatures for periods of 1–23 days, contained active diastase in the protoplasts. More enzyme was found in young leaves than in old ones and none in fallen dead leaves. Boiling after autolysis destroyed the enzyme. Diastase in leaves appears almost wholly in combination with the protoplast, but in the course of autolysis the enzyme thus bound splits off and passes into solution. The nature of the enzyme-protoplast combination is not known.—*W. W. Bonns.*

4548. Sandberg, M. Ueber den Verlauf der alkoholischen Gärung in Gegenwart von Harnstoff. [The course of alcoholic fermentation in the presence of urea.] Biochem. Zeitschr. 128: 76–79. 1922.—The addition of urea to sucrose solutions consistently decreased alcohol production in fermentation by 3 different bottom yeasts. Quantitative determinations indicate that the urea is not utilized in the process.—*W. W. Bonns.*

4549. Sears, H. J., and John J. Putnam. **Gas production by bacteria in symbiosis.** Jour. Infect. Diseases 32: 270–279. 1923.—Gaseous fermentation of substances was determined by various pairs of organisms growing in symbiosis, neither of which could produce the gas alone from these substances. Gas was produced only when an acid-former capable of fermenting the sugar was mixed with a gas-former not able to produce gas from this sugar. No quantitative relationships were noted as to the numbers of each organism that should be present. The symbiosis is not a simple gas production by the gas-former from the acid produced by the acid-former.—*R. L. Starkey.*

4550. Vilmorin, Jacques de, et Cazaubon. **Sur la catalase des graines.** [The catalase of seed.] Compt. Rend. Acad. Sci. Paris 175: 50–51. 1922.—In peas a direct relation is found between the amount of catalase and the degree of vitality of the seed. But in certain trees, such as pines and larch, the catalase content of the seed appears to be independent of the vitality.—*C. H. Farr.*

4551. Wester, D. H. **Ueber den Einfluss von verschiedenen Kationen und Anionen und von Elektrolyt-Mischungen auf die harnspaltende Wirksamkeit von Urease. [The effect of different cations, anions, and mixtures of electrolytes on the urea-cleaving action of urease.]** Biochem. Zeitschr. 128: 279–292. 1922.—Urease action in soy bean and canavalia bean extracts was reduced in presence of tannin, iodine, or copper sulphate. It was not noticeably affected by chloroform, thymol, or mustard oil when these were added in amounts sufficient to inhibit bacterial growth. Neither methyl nor ethyl alcohol had any effect on urease activity in concentrations of 1 mol per liter, but amyl alcohol proved slightly inhibitory. With respect to their inhibitive power, the ions studied may be graded in ascending order in several groups comparatively studied as follows: K, Na, Ba; I (Cl, Br, NO_3), SO_4; K, Li. K_2SO_4 plus $LiSO_4$ had less effect than the sum of the effects of each. Ammonium chloride used alone increased activity, while in presence of other salts it reduced the inhibitory action of the latter.—*W. W. Bonns.*

METABOLISM (RESPIRATION, AERATION)

4552. Atkins, W. R. G. **The respirable organic matter of sea water.** Jour. Marine Biol. Assoc. United Kindgom [Plymouth] 12: 772–780. 1922.—On storing, sea water suffers a decrease in pH value due to the production of carbonic acid by organisms; this probably indicates the amount of plankton present, at least when sewage contamination is negligible. It appears that water near the surface, at 20–25 m., and sometimes at the bottom, 70 m., is particularly subject to change during storage. The total amount of carbon, reckoned as hexose, which is set free by respiration during storage in sea water at 5 m. is about twice that photosynthesized between July and December, taking for the latter the minimum value 3 mgm. per l., giving a total of 6 mgm. per l.—*Marshall A. Howe.*

4553. Combes, Raoul, et Denise Kohler. **Rôle de la respiration dans la diminution des hydrates de carbone des feuilles pendant le jaunissement automnal. [The rôle of respiration in the diminution of carbohydrates in leaves during autumnal yellowing.]** Compt. Rend. Acad. Sci. Paris 175: 406–409. 1922.—Sachs held that all of the substances useful to the tree passed into it from the leaves before the latter fell in the autumn. Wehmer was one of the first plant physiologists to show that this is not the case. *Fagus silvatica, Aesculus Hippocastanum,* and *Ampelopsis hederacea* are here studied in this connection. It is concluded that much of the decrease in carbohydrate content of the leaves during yellowing is due to respiration. Some is carried off by washing with rain, and some migrates to the stem.—*C. H. Farr.*

4554. Harrington, George T., and William Crocker. **A new and efficient respirometer for seeds and other small objects: directions for its use.** Jour. Agric. Res. 23: 101–115. *Pl. 1, 2 fig.* 1923.—With the apparatus described, O_2 consumption and CO_2 production are determined in the same apparatus, for the identical period of time, and with the use of the whole volume of air instead of a sample of it. The gaseous exchanges are determined, at the end of an experimental period, by means of a manometer which is an integral part of the apparatus. Useful tables and directions for making computations are included. A bibliography of 32 titles is appended.—*D. Reddick.*

4555. Molliard, M. **Influence de la nature de l'aliment azoté sur les échanges gazeux. [Influence of the kind of nitrogenous nutrition on gaseous exchange.]** Rev. Gén. Bot. 35: 6–23. 1923.—*Sterigmatocystis nigra, Stichococcus bacillaris,* and *Isaria densa* were studied and the author's conclusions are as follows: (1) nitrates and other nitrogenous substances, such as sodium urate, increase the respiratory quotient, as well as the intensity of intramolecular respiration of both autotropic and heterotropic plants; (2) this action is of a catalytic nature; (3) asparagin, leucin, and glycocol constitute for *Isaria densa* a complete organic food; (4) egg albumen is a complete organic and mineral food for *Isaria densa;* on this account albumen and diverse protein substances are more profoundly attacked in the absence than in the presence of sugar; (5) the respiratory quotient is higher in the presence than in the absence of sugar for those substances furnishing both carbon and nitrogen.—*J. C. Gilman.*

4556. Stoklasa, J. **Sur la respiration des racines. [The respiration of roots.]** Compt. Rend. Acad. Sci. Paris **175:** 995–997. 1922.—Nineteen species of plants are studied and the effect of radioactivity on CO_2 liberation determined. In all cases it is found that the liberation is greater with radioactivity than without it.—*C. H. Farr.*

4557. Thunberg, T. **Besteht ein genetischer Zusammenhang zwischen dem eingeatmeten Sauerstoff der ausgeatmeten Kohlensäure? [Is there a genetical relation between the inspired oxygen and the respired carbonic acid?]** Naturwissenschaften **10:** 417–420. 1922.

ORGANISM AS A WHOLE

4558. Atkins, W. R. G. **The hydrogen ion concentration of sea water in its biological relations.** Jour. Marine Biol. Assoc. United Kingdom [Plymouth] **12:** 717–771. 1922.—The paper is largely physico-chemical, but the biological relations of the algae to the composition of the sea water are involved. Sea water may become as alkaline as pH 9.7 as the result of very active photosynthesis, in virtue of the presence of magnesium salts. The salt-water tanks of the Plymouth laboratory are always less alkaline than the water of Plymouth Sound. The water of the Sound varies slightly with the state of the tide; a drop of 0.05 pH may be observed between high and low water and during July is more alkaline than that of the open sea. Over *Laminaria* in shallow water, through which the tops of the algae appear, the water may be 0.15 pH more alkaline than the general mass of water. Rock pools in summer may be at least as much as 0.25 pH more alkaline than the Sound water.—*Marshall A. Howe.*

4559. Atkins, W. R. G. **The influence upon algal cells of an alteration in the hydrogen ion concentration of sea water.** Jour. Marine Biol. Assoc. United Kingdom [Plymouth] **12:** 789–791. 1922.—Sea water originally at pH 8.2 became as alkaline as pH 9.4 by the photosynthetic action of *Ulva* in removing carbonic acid. This degree of alkalinity did not prove injurious to *Ulva*, but exposure to it for 2½ hours at 27°C. sufficed to increase the permeability of the superficial cells of *Ceramium rubrum* irreversibly and fatally. It is suggested that the above facts have a bearing upon the distribution of these and similar algae upon the shore.—*From Author's summary.*

4560. Costantin, J. **La dégénérescence des plantes cultivées et l'hérédité des caractères acquis. [Degeneracy and the heredity of acquired characters.]** Ann. Sci. Nat. Bot. **4:** 267–297. *Fig. A, B.* 1922.—The peculiar physiological adjustments necessary for best development of the potato (*Solanum*) and the formation of good tubers is attributed to the suppression of certain endophytic, tubercle-producing fungi possessed by the ancestor of the cultivated plant. The same principle is discussed in application to other plants and to the acclimatization of plants, especially perennials.—*Paul Weatherwax.*

4561. Davy de Virville, Adrien, et Fernand Obaton. **Observations et expériences sur les fleurs éphémères. [Observations and experiments on ephemeral flowers.]** Compt. Rend. Acad. Sci. Paris **175:** 637–640. 1922.—Ephemeral flowers are defined as those which ordinarily open only once. They are found to be very sensitive to external conditions. The effects of temperature, humidity, and light were studied with respect to the opening of *Helianthemum guttatum*, *Anagallis arvensis*, and *Phaenopus murialis*. It is found that they can be prevented from opening by keeping the temperature low. Light is found to have no effect and humidity has very little.—*C. H. Farr.*

4562. Davy de Virville, Adrien, et Fernand Obaton. **Sur l'ouverture et la fermeture des fleurs météoriques persistantes. [On the opening and closing of flowers which open more than once.]** Compt. Rend. Acad. Sci. Paris **175:** 841–843. 1922.—Two types of these flowers are found, the nocturnal and diurnal. They are in general less sensitive to environment than the ephemeral flowers. Examples discussed are *Erythraea Centaurium*, *Taraxacum Dens-leonis*, *Bellis perennis*, and *Leontodon hispidus*. It is found that the opening and closing is largely dependent upon temperature, as stated by Hoffmann in 1850 and by Royer in 1868. Humidity

has very little effect, and light has no effect. But it is still necessary to consider the movement as affected by hereditary periodicity.—*C. H. Farr.*

4563. Dufour, Léon. **Causes de l'apparition, en grande abondance, de certains champignons à la suite d'un incendie de forêt.** [Reasons for the appearance of fungi after forest fires.] Bull. Trimest. Soc. Mycol. France 38: 93–97. 1922.—The occurrence of such forms as *Plicaria leiocarpa*, *Aleuria violacea*, and *Geopyxis carbonaria* on recently burned areas may be due to the increased amount of nitrates found in soil after burning. Increased light and aeration are among the factors responsible, as is indicated by the fact that similar fungi are found on areas from which trees have been removed by cutting. In this case however the process extends over a longer period and the fungi do not appear until the second season after the land has been cleared.—*D. S. Welch.*

4564. Euler, H. von, und O. Svanberg. **Einige Versuche über die Aciditätsbedingungen des Zuwachses von Bacillus macerans und über den Verlauf der Stärkespaltung.** [Experiments on the acidity conditions for growth of Bacillus macerans and the course of starch cleavage.] Biochem. Zeitschr. 128: 323–326. *1 fig.* 1922.—Optimum acidity for growth was found to be close to pH 6.8 when grown on potato starch. Inhibition was marked between pH 5 and pH 6. Starch cleavage was determined by the iodine test, by loss in weight, by total carbohydrate value in terms of glucose, and by the amount of direct reducing compounds. A point is reached where the iodine reaction disappears, but the total carbohydrate value remains constant and the loss in weight as well as the amount of direct reducing substances remains very small (the latter about 1 per cent of the total starch). The reaction of this organism is greatly affected by the composition of the substrate as well as by the temperature. No determinations of specific enzymes were attempted.—*W. W. Bonns.*

4565. Frankenthal, K. **Zur Biologie des Influenzabacillus.** [The biology of the influenza bacillus.] Biochem. Zeitschr. 128: 122–123. 1922.—The author discusses the physiological relation of the influenza bacillus to histidine and its growth on histidine-agar.—*C. C. Epling.*

4566. Fritz, Clara W. **Experimental cultures of diatoms occurring near St. Andrews, N. B.** Contr. Canadian Biol. 1918–1920: 63–66. 1921.—Marine plankton species of diatoms were experimented with in various media and environments. *Melosira hyperborea* can endure a great variety of light conditions, but the optimum development is obtained in strong diffuse light. It can endure a range of 40 degrees in temperature and a diminution to 40 per cent of sea water, even existing for a time in tap water. Increased concentration of sea water is detrimental. Excellent persistent cultures may be obtained in artificial sea water.—*Marshall A. Howe.*

4567. Maquenne, L., and E. Demoussy. **Sur la végétation dans des milieux pauvres en oxygène.** [Growth on media low in oxygen.] Compt. Rend. Acad. Sci. Paris 174: 1387–1392. 1922.—Pear, radish, wheat, and colza seeds were germinated under water and grown during 14–30 days. It was found that they can develop with the limited amount of O_2 available, as do aquatic plants. If the plants are placed in sunlight and the water is saturated with air and charged with CO_2, O_2 is liberated in bubbles from 1 or 2 places about 10 cm. from the base of the stem much as from the cut surfaces of aquatic plants.—A study is also made of green plants in a vacuum. It is found that longevity and activity vary much with the species studied. Some, notably the sorrel, do not survive longer than 24 hours. The leaf of aucuba, however, was able to assimilate 2.4 cc. of CO_2 in 6 hours after having been a year in a vacuum before a south window. Another leaf under similar conditions showed a liberation of O_2 of 0.5 cc. In darkness, however, they die. The difference in plants is attributed to the $\frac{CO_2}{O_2}$ ratio of respiration.—*C. H. Farr.*

4568. Möbius, M. **Die Vorbereitung der Pflanze für den Winter.** [The preparation of the plant for winter.] Ber. Senckenberg. Naturf. Ges. Frankfurt am Main **51**: 32. 1921.—A resumé is given of a lecture on the changes undergone by plants during the autumn. The modifications in the pigments and the separation of the leaves, the nature of the leaf-scars, the structure of the winter buds, and the storage of reserve foods are among the topics considered.—*A. W. Evans.*

4569. Reith, Allan F. **Growth of Pfeiffer bacillus in mixed culture in blood-free medium.** Jour. Infect. Diseases **32**: 243–246. 1923.—The Pfeiffer bacillus was grown in blood-free medium when in association with either *Bacillus subtilis* or *Staphylococcus albus.*—*R. L. Starkey.*

GROWTH, DEVELOPMENT, REPRODUCTION

4570. Kotte, Walter. **Wurzelmeristem in Gewebekultur.** [Cultures of rootmeristem.] Ber. Deutsch. Bot. Ges. **40**: 269–272. *Fig. 1–3.* 1922.—Root meristems (pieces of root tip 1 mm. long, including the root cap) from *Zea Mays* and *Pisum sativum* were isolated and grown under sterile conditions on Knop's solution plus 1.5 per cent agar and glucose with 1 of several sources of nitrogen supplied. Under these conditions the root tips were able to develop into "apparently normal roots" in 10–12 days. The experiments indicate that the cells of isolated root meristem are capable of division and differentiation. The author concludes that if, as Haberlandt assumes, cell division in primary meristems is dependent upon the influence of hormones, the primary meristem of these root tips must be able to supply these hormones.—*W. C. Muenscher.*

4571. Ludwig, C. A. **The growth of tree twigs.** Proc. Indiana Acad. Sci. **1921**: 121–131. *Charts 1–6.* 1922.—Shoots of *Prunus Persica* (L.) Stokes and *Cornus florida* L. were measured during 1 season of growth, showing a slow rate of growth at first, which then increased to a maximum, and later decreased to zero before the temperature had dropped to the point at which growth started in the spring. The slow growth at the beginning of the season is thought to be due to the cool weather, while the decline is thought to be partly due to lack of available moisture, or in some cases to shading. The capacity of the dogwood to grow in shaded situations seems to be due not to the ability to grow in shade, but to endure it. In these branches growing at an angle to the vertical, the terminal shoot of dogwood grows less than the closely set laterals, the outermost of which takes the lead and becomes the main shoot of the branch.—*F. C. Anderson.*

4572. Mason, T. G. **A note on the growth and the transport of organic substances in bitter cassava (Manihot utilissima).** Sci. Proc. Roy. Dublin Soc. **17**: 105–112. *1 fig.* 1922.—Plants were ringed in order to determine whether there was any factor correlating the activity of the cells of the apical meristem and the growth of the tuberous roots. It was found that the rate of growth of the stem in height was not affected by the operation for 3 weeks, when a retardation was observed. The final weight of the tuberous roots of the ringed plants was about a quarter of that of the unringed, whereas the stem was over 1.2 times as heavy. It was concluded that the activity of the cells of the apical meristem was not controlled by the supply of organic substances available, but by autogenous changes. The rate of growth was conditioned by autocatalytic reactions.—*W. R. G. Atkins.*

4573. Pearl, Raymond, and Lowell J. Reed. **A further note on the mathematical theory of population growth.** Proc. Nation. Acad. Sci. [U. S.] **8**: 365–368. 1922.—The equation $y = \frac{be^{ax}}{1 + ce^{ax}}$, as has been shown, represents well the population growth of the U. S. A. More general equations are here discussed, including forms for successive cycles of population growth, as (for any single cycle), $y = d + \frac{k}{1 + me^{a_1x + a_2x_2 + a_3x_3}}$, where d represents the growth previously attained. One special form is "similar in shape to the autocatalytic curve."—*Howard B. Frost.*

4574. Penners, Andreas. **Über die Rolle von Kern und Plasma bei der Embryonalentwicklung. On the rôle of the nucleus and of the cytoplasm in embryonal development.]** Naturwissenschaften 10: 728–733, 761–765. 1922.—The subject-matter is briefly reviewed and a short bibliography appended.—*C. C. Epling.*

4575. Riede, Wilhelm. **Die Abhängigkeit des Geschlechtes von den Aussenbedingungen. [Effect of external conditions on sex.]** Flora 115: 259–272. 1922.—Riede has continued his studies on the correlation between the stage in the ontogeny of a plant and the quotient represented by the ratio of carbon assimilation to absorption of inorganic salts, and he finds that in *Zea mays* the quotient must be higher for the development of pistillate flowers than for staminate.—*A. G. Stokey.*

4576. Rippel, August. **Die Wachstumskurve. [Growth curve.]** Ber. Deutsch. Bot. Ges. 37: 169–175. *Fig. 1.* 1919.—The author finds that growth curves plotted from experimental data with plants agree fairly closely with Robertson's formula, but not with Mitscherlich's.—*W. C. Muenscher.*

4577. Terroine, Émile-F., et René Wurmser. **Le rendement énergétique dans la croissance de l'Aspergillus niger. [Energy production during the growth of Aspergillus.]** Compt. Rend. Acad. Sci. Paris 174: 1435–1437. 1922.—The utilization ratio (0.44) is the ratio of dry weight of *Aspergillus* produced to weight of glucose consumed. The energy value of the original glucose, of the resulting mycelium, and of the CO_2 liberated in the meantime are determined. It is found that $c = p\ (a + \frac{1}{2}bt)$ if c = the quantity of glucose consumed at the end of the time t, p = the final dry weight, a = constant representing the consumption necessary to maintain 1 gm. of mycelium, b = a constant representing the consumption necessary to maintain 1 gm. of mycelium per hour; then $b = 2\,\frac{c_2 - c_1}{p(t_2 - t_1)}$, if c_1 and c_2 represent the consumption necessary to produce p gm. in t_1 and t_2 intervals of time respectively.—*C. H. Farr.*

4578. Weber, Friedl. **Frühtreiben durch Quetschen. [Forcing by squeezing.]** Ber. Deutsch. Bot. Ges. 40: 148–152. 1922.—The buds of *Syringa vulgaris* were squeezed for short periods of time with screw cocks. Buds treated in this manner would start to develop into shoots very soon when placed in a greenhouse even at the beginning of the dormant period. The author suggests that forcing is here caused by the wound hormones produced in the injured buds.—*W. C. Muenscher.*

MOVEMENTS OF GROWTH AND TURGOR CHANGES

4579. Azoulay, Léon. **Sur le rapprochement provoqué et spontané des feuillets de Russula Queletii (Fr.) Bataille et ses variétés. [On the spontaneous and induced union of the gills of Russula Queletii and its varieties.]** Compt. Rend. Acad. Sci. Paris 175: 597–599. 1922.—By passing a brush or a sheet of rough paper between the gills it is found that they stick together so that the paper is drawn out with great difficulty. The gills remain in contact until the fungus becomes dry and withered. There appears thus to be a sensitivity analogous to that of *Mimosa pudica.* It is found that the union does not occur in the presence of ether or chloroform.—*C. H. Farr.*

REGENERATION

4580. Löffler, Bruno. **Experimentelle Untersuchungen über Regeneration des Gipfels und Kontaktempfindlichkeit bei Windpflanzen. [Experiments on regeneration of the tips of twining plants.]** Ber. Deutsch. Bot. Ges. 37: 6–24. *Fig. 1–8.* 1919.—The author points out that when the terminal buds are removed from young plants of *Phaseolus vulgaris* and *Humulus Lupulus* the upper axillary bud on the side of the stem in contact with a pole or support develops into the main axis. Experiments here reported indicate that this unequal growth is not due to a difference in illumination or to the position of the bud on the stem but is due to the stimulus of contact from the support.—*W. C. Muenscher.*

GERMINATION, RENEWAL OF ACTIVITY

4581. Harrington, George T. **Forcing the germination of freshly harvested wheat and other cereals.** Jour. Agric. Res. 23: 79–100. 1923.—Wheat [*Triticum*], barley [*Hordeum*] and oats [*Avena*] were included in the test. The forcing of wheat seed in particular is necessary in administering seed laws in winter wheat areas, where the interval between harvest and seeding is very short. Dry heat for 8 days at 40°C. was the most satisfactory of the heat treatments tried. Presoaking the seed in water for 1 hour and for 5 hours increased slightly the percentage of germination at the end of 31 hours but at the end of 4 days the percentage of germination in oats and barley was less than for untreated seed. Surface disinfection of seed with 1 per cent silver nitrate solution did not affect germination. Scratching the embryo along its whole length stimulated germination, and removal or weakening the coat structures of wheat by treatment with sulphuric acid was exceedingly effective in inducing complete germination in a minimum length of time. Increasing the amount of oxygen to 36 per cent (optimum) stimulated germination. Most satisfactory germination is secured when the seed bed is of such nature as to furnish abundant moisture for absorption without actually flooding the grains. Incubation of the seeds at a temperature of 12–16°C. gives the best results.—In all cases it appears that the oxygen relation is the important consideration in the germination of not after-ripened seed of cereals.—Some samples of seed after-ripen much more rapidly than others. After-ripening and loss of water are concomitant processes but are independent, and there is no relation between water content of seed and germinability.—*D. Reddick.*

4582. Harrington, George T., and Bertha C. Hite. **After-ripening and germination of apple seeds.** Jour. Agric. Res. 23: 153–161. 1923.—Seed of the apple require a period of after-ripening. The dormancy is inherent in the embryo itself. After-ripening is accomplished in a few months when the seed are kept moist and at a temperature between 5 and 10°C.; it does not take place in dry seed nor in moist seed which are stored at 20°C. or above. The optimum temperature for germination of after-ripened seed lies between 10 and 20°C. Removal of seed-coats of after-ripened seed hastens germination but it has no effect on dormant seed. On the other hand, removal of seed-coats of seed held under suitable germination conditions but at a temperature too high to effect after-ripening often germinate well upon removal of the seed-coats. The inner seed-coat is effective in preventing the decay of seed.—*D. Reddick.*

4583. Noble, R. J. **Studies on Urocystis Tritici Koern., the organism causing flag smut of wheat.** Phytopathology 13: 127–139. *Pl. 10, fig. 1–2.* 1923.—A study was made of the germination of the spores of *Urocystis Tritici* Koern. under various conditions in regard to substratum, temperature, aeration, and age of spores. Several organic and inorganic media were tried; none offered any special advantage. In distilled water the percentage germination was very low. Some germination occurred in soil extract, but the percentage was little if any higher than in distilled water. Germination was not stimulated by changing the H-ion concentration with sodium phosphate, by changing the surface tension of the substratum with soaps of fatty acids, or by the addition of various organic acids. Germination was very markedly stimulated when tissue of young wheat plants was added to distilled water in which the spores had soaked for several days. In this case 70–90 per cent of the spores germinated. A decoction made from young wheat plants, or a distillate from this decoction, produced the same effect when added to spores presoaked in distilled water. Tissue from a number of other plants also stimulated germination. The minimum, optimum, and maximum temperatures for spore germination appeared to be 5, 18–24, and 32°C. respectively. Apparently the spores do not require a rest period before germination.—*B. B. Higgins.*

TEMPERATURE RELATIONS

4584. Gain, Edmond. **Sur la résistance comparative à la chaleur des points végétatifs de l'embryon du Grand-Soleil. [On the comparative resistance to heat of vegetative points of the embryo of the sunflower.]** Compt. Rend. Acad. Sci. Paris 174: 1557–1559. 1922.—The author

showed in a previous paper that sunflower seed may resist a heat of 145–150°C. for 10 minutes and retain germinating power. It might be considered that the embryo has 5 parts: the root meristem, the shoot meristem, the cotyledons, the hypocotyl, and the base of the cotyledons. The root meristem is anatomically exposed, while the shoot meristem is protected by the cotyledons. Experiments show that the root meristem displays the least resistance to heat, and, if it is destroyed, is replaced by the embryonal cells of the axis of the hypocotyl. The shoot meristem is next most sensitive. It is replaced, if killed or inhibited, by the base of the cotyledons or the axis of the hypocotyl. The base of the cotyledons is found to be most resistant.—*C. H. Farr.*

RADIANT ENERGY RELATIONS

4585. Boresch, K. **Ueber die Einwirkung farbigen Lichtes auf die Färbung von Cyanophyceen. [Effect of colored light upon the color of Cyanophyceae.]** Ber. Deutsch. Bot. Ges. 37: 25–39. 1919.—The ability of certain Cyanophyceae to react to the color of the incident light by absorbing a complementary color was shown for *Phormidium foveolarum* in experiments in which light was passed through a spectroscope or color screen. This chromatic adaptation is not related to the discolorations following the exhaustion of the nitrates of the substratum. It was demonstrated that in *Phormidium foveolarum* the discoloration due to colored light depends upon the development of various phycocyanin modifications.—*W. C. Muenscher.*

4586. Harvey, R. B. **Growth of plants in artificial light.** Bot. Gaz. 74: 447–451. *Fig. 1–2.* 1922.—Nitrogen-filled tungsten filament (Mazda) lamps were used. The lamps were placed 5 feet from the plants; reflectors were used. The 1,000 watt lamps proved most economical, lasting for 4 months. The lamps furnished all heat necessary in the basement rooms used. The small grains, flax, buckwheat, white sweet clover, peas, beans, lettuce, and a number of common weeds were successfully grown from seed to maturity in the continuous light and all set good seed. Other plants such as potato, red clover, and squash blossomed but did not set seed. Potato tubers of good size were obtained. With none of the plants was it necessary to furnish a definite illumination period in order to obtain bloom. The author has shown it possible "to produce seed from plants in winter, independent of sunlight, and at no very great expense."—*B. W. Wells.*

4587. Mirande, Marcel. **Influence de la lumière sur la formation de l'anthocyanine dans les écailles des bulbes de lis. [The influence of light on the formation of anthocyanin in the scales of lily bulbs.]** Compt. Rend. Acad. Sci. Paris 175: 496–498. 1922.—This is a study of the effect of intensity of light on anthocyan formation. Anthocyan is produced only in diffuse light, but not at all altitutes. For instance it is formed at 300 m., but not at 2,000. Six intensities were used in the experiments, varying from 53 to 7 per cent. At 300 m. no redness is found in 53 per cent; it begins in 39 per cent and reaches a maximum in 22 per cent. At 600 m. redness begins in 22 per cent and the maximum is reached in 13. At 2,000 m. redness begins in 13 and the maximum is in 7 per cent. It is concluded that the visible rays of the spectrum are favorable to reddening, but the ultraviolet and infra red are unfavorable. A study with Wratten filters shows that blue and indigo are most active, red light somewhat, and green not at all.—*C. H. Farr.*

4588. Mirande, Marcel. **Sur la formation d'anthocyanine sous l'influence de la lumière dans les écailles de bulbes de certains lis. [The formation of anthocyanin under the influence of light in the scales of the bulbs of certain lilies.]** Compt. Rend. Acad. Sci. Paris 175: 429–430. 1922.—Bulb scales of lily are favorable for the study of anthocyans. Detached scales do not form anthocyan in the absence of light.—*C. H. Farr.*

4589. Petry, E. **Zur Kenntnis der Bedingungen der biologischen Wirkungen der Röntgenstrahlen. II Mitteilung. [The conditions of biological action of X-rays. II Contribution.]** Biochem. Zeitschr. 128: 326–353. 1922.—Seed of various economic plants at different

stages of water content were used. A brief period of water absorption ("Quellung") was found to increase susceptibility to X rays, in both dried seeds and dried seedlings. Such susceptibility is explained as a function of hydration degree, analogous to heat injury of plant members, enzymes and albumens. Swelling in the absence of oxygen and under experimental conditions of inhibited germination does not reduce the relation of germination to ray susceptibility. Dried seedlings were generally more susceptible than resting dried seeds. The explanation is an increased susceptibility due to chemical processes of germination.—*W. W. Bonns.*

4590. Weber, F. **Frühtreiben ruhender Pflanzen durch Röntgenstrahlen.** [Forcing of resting plants with X-rays.] Biochem. Zeitschr. 128: 495–507. 1922.—Winter buds of *Syringa vulgaris* responded to X-ray treatment by shortening the rest period. The "dosage" necessary for such effect is high, the maximum being 150 units, the minimum 26. Stronger doses resulted in necrosis and subsequent cropping of buds. The region of greatest susceptibility to the rays appears to be the basal zone of the bud parenchyma, the so-called "oxalate nest"; embryonic cells of the growing tip are less sensitive. As possible explanations of X-ray effects are listed enzyme activation, permeability alteration, respiration increase, and wound hormone formation.—*W. W. Bonns.*

TOXIC AGENTS

4591. Boas, Friedrich. **Die Wirkungen der Saponinsubstanzen auf die pflanzliche Zelle.** [The effects of saponins upon the plant cell.] Ber. Deutsch. Bot. Ges. 40: 249–253. 1922.—In dilute concentrations cyclamin and digitonin stimulate fermentation in yeast but in concentrated solutions fermentation is inhibited. The effect of cyclamin and digitonin is produced by combining with cholesterol of the cell. The precipitation of cholesterols disturbs the structure of the plasma and death follows. No relationship was found between the surface tension of saponins and their effect upon fermentation.—*W. C. Muenscher.*

4592. Boyle, C. **The growth relations of certain fungi to their staling products.** [Abstract.] Phytopathology 13: 33–34. 1923.

4593. Cobet, R., und V. von D. Reis. **Ueber den Einfluss der arsenigen Säure auf das Bakterium Wachstum. Nebst Bemerkungen über Randwulstbildungen durch sogennante oligodynamische Metallwirkung.** [The effect of arsenical acids on bacterial growths, with observations on marginal aggregations as the result of the so-called oligodynamic effect of metals.] Biochem. Zeitschr. 129: 73–88. *Fig. 1, 2.* 1922.—Placing arsenious acids in the center of agar plates sown with bacteria results in a sterile zone in the immediate vicinity, with a region of specially strong growth contiguous thereto. This is not accounted for as a toxin stimulus. Increased bacterial growth is not due to the presence of the acid. Analogous results are obtained by substituting a silver coin for the acid.—*W. W. Bonns.*

4594. Molliard, Marin. **Influence des sels de cuivre sur le rendement du Sterigmatocystis nigra.** [Influence of copper salts on the yield of Sterigmatocystis nigra.] Compt. Rend. Acad. Sci. Paris 175: 838–841. 1922.—The yield is the ratio of weight of mycelium to the weight of sugar consumed. It is found that copper retards the growth and also reduces the yield, that is, the amount of mycelium formed per gm. of sugar. However the sugar (7 gm.) disappears entirely in 10 days without copper, and lasts for 40 days with copper sulphate.—*C. H. Farr.*

4595. Nicholas E., et G. [Nicolas.] **Influence du formol sur les végétaux supérieurs.** [Influence of formalin on higher plants.] Compt. Rend. Acad. Sci. Paris 175: 1437–1439. 1922.—The bean was studied as to growth in diameter and increase in weight in various solutions. The control was in Knop's solution. Other solutions contained, in addition to the salts in Knop's solution, 0.321 gm., 0.803 gm., and 1.606 gm. of formalin respectively. The last named solution was markedly toxic. Aerial parts produce greater weight in 0.321 gm.,

but the roots weigh slightly less than in the control. In 0.803 gm. the roots weigh much less, and the aerial parts about the same. It is stated that 0.321 gm. contains 125 mgm. of formaldehyde, which corresponds to 1 dgm. of hexamethylenetetramine. It is concluded that formaldehyde acts in this concentration as a food for the chlorophyll.—*C. H. Farr.*

4596. Nicholas, E., et G. [Nicolas.] **L'action de l'hexaméthylènetétramine sur les végétaux supérieurs. [The effect of hexamethylenetretramine on higher plants].** Compt. Rend. Acad. Sci. Paris **175:** 836–838. 1922.—The effect of this compound, $(CH_2)_6N_4$, on the bean in culture solution is studied. 0.1–0.25 gm. per l. of Knop's solution gives slight stimulation, shown by increased weight of the plant; 0.5–1.5 gm. per l. has a markedly injurious effect, retarding digestion in the cotyledons.—*C. H. Farr.*

4597. Pieri, C. **Su alcune alterazione nel ricambio materiale di vegetali che vivono in atmosfera contenente anidride solforosa. [On some alterations in the constitution of plants in an atmosphere containing sulphuric anhydrid.]** Mem. Soc. Toscana Sci. Nat. **32:** 173–186. 1919.—Young specimens of *Pinus pinea* were subjected to fumes containing sulphuric anhydrid. Analyses of the ash from these plants indicated that the amount of calcium diminished perceptibly, magnesium and silicon slightly, while that of sulphur increased noticeably in proportion to the strength of the gas.—*Edith K. Cash.*

4598. Stoklasa, J. **Influence du sélénium sur l'évolution végétale, en presence ou en absence de radioactivité. [The influence of selenium on plant development, in the presence or absence of radioactivity.]** Compt. Rend. Acad. Sci. Paris **174:** 1256–1258. 1922.—A study was made of *Hordeum distichum, Zea mays, Polygonum fagopyrum, Vicia faba, Soja hispida,* and *Lupinus angustifolius* in culture solution. Selenites and alkaline seleniates were added to the amount of 5.10^{-6}–10^{-2} atom-gm. per l. It is found that very weak sodium selenite produces a stimulating effect, especially on corn. The higher concentrations are, however, very toxic and finally result in death. If radium is added to the extent of 0.0000056 mg.per plant per day, the plants in all cases showed 2–15 times the dry weight of plants without emanation. It is found that the emanations completely neutralize the toxic effect of the sodium selenite.—*C. H. Farr.*

ELECTRICITY AND MECHANICAL

4599. Bersa, E., und F. Weber. **Reversible Viskositätserhöhung des Cytoplasmas unter der Einwirkung des elektrischen Stromes. [Reversible increase in the viscosity of cytoplasm by the electric current.]** Ber. Deutsch. Bot. Ges. **40:** 254–258. 1922.—A method outlined by Weber making use of the cataphoretic migration velocity of colloidal particles, that is, of the starch particles or "statoliths," was used to determine whether the cytoplasmic viscosity changes with the passing of an electric current. With *Phaseolus multiflorus* the author finds that the increased viscosity due to the action of the current is not only appreciable but is also reversible, since after a short period of time the protoplasmic viscosity almost or completely reaches the normal viscosity level.—*F. S. Howlett.*

4600. Schaffers, V. **La foudre et les arbres. [Lightning and trees.]** Compt. Rend. Acad. Sci. Paris **175:** 1087–1089. 1922.—The electrical potential of discharge of twigs was measured, as of metal points. A normal, freshly picked leaf was fixed to a 2 cm. disc, isolated, and positively charged with a static machine. The leaf was connected with the ground through a galvanometer. Sixteen kinds of trees were tested. Figures are given for the galvanometer readings and these compared with the percentages of trees of each species struck by lightning as given by Vanderlinden for 1884–1901 in Belgium and by Prohaska in Styria and Carinthia (Austria). No correspondence is found between the lists, hence it is concluded that trees do not protect against lightning.—*C. H. Farr.*

4601. Stern, Kurt. **Über polare elektronastische Erscheinungen. [Polar electrical phenomena.]** Ber. Deutsch. Bot. Ges. **39:** 3–10. *Fig. 1–4;* 11–20. 1921; **40:** 43–51. *Fig. 1–2:* 54–59. *Fig. 1.* 1922.—Continuing earlier work the author has studied the effect of electrical

stimulation upon several plants. *Berberis nitens* and *B. vulgaris* var. *atropurpurea* showed a strong stimulation of the stamens at the negative electrode with a discharge from a condenser of 36 volts. *B. vulgaris* var. *microphylla* showed no distinct polarity. The leaves of *Biophytum sensitivum* reacted at the negative electrode and the stimulus went toward the positive with 12 volts, but with 60 volts the reaction was at both electrodes. The leaves of *Mimosa Spegazini* were stimulated at the positive electrode with all voltages used. Those of *M. pudica* were stimulated at the negative electrode with 40 volts, direct current, and at the positive electrode with 250 volts. If the circuit was left closed the leaves recovered. Upon opening the circuit there was no response, or a weak one at the positive electrode under strong stimulation. This result was not the same as obtained with animal tissue. It was pointed out that there are other factors than the length of tissue between the electrodes which determines the amount of current which flows. By reversing the current it could be determined whether the reaction at one electrode was due to polarity or to a difference in current intensity at that node. The conduction of stimuli and the reaction time of nodes are discussed with reference to the interpretation of results. Also the effect of leaflets touching each other and the grounding of the pot, thus allowing the current to be divided. It is suggested that sleep movements of plants may be due to changes in conductivity of the air and in potential, thus affecting the currents which naturally pass through the plant, since these movements were interfered with when the plant was insulated from the ground. Using the precautions referred to and gradually increasing the potential it was found that the stimulation of leaves was decidedly stronger at the negative electrode in the majority of cases; in some cases equal or opposite. Sometimes different polarity was obtained with leaves of different ages, but this needs further investigation. The nature of the polarity depends upon internal factors as well as upon the character of the current. The effect of H-ion concentration has not been sufficiently investigated.—*H. H. Clum.*

MISCELLANEOUS

4602. Manley, J. J. **On the production of coloured flames for use with spectrometers and polarimeters.** London, Edinburgh and Dublin Phil. Mag. **45**: 336–337. *1 fig.* 1923.—A glass tube with bulb is fitted to a vitreosil pipe of 1 mm. bore. Three or 4 fine platinum wires inserted in the latter serve as a wick to deliver solutions of chlorides of appropriate metals to the Bunsen flame.—*W. R. G. Atkins.*

4603. Weatherwax, Paul. **The popping of corn.** Proc. Indiana Acad. Sci. 1921: 149–153 1922.—Popping of corn is due to the expansion, under pressure, of moisture contained in the starch grains. The hardness of the endosperm is responsible for the difference between popping and non-popping varieties of corn. For successful popping, the heat must be applied rapidly enough to generate steam faster than it escapes, and slowly enough to allow hydrolysis of most of the starch before the explosion occurs. A temperature of 175°–200°C. reached in 2.5–3 minutes yields best results.—*F. C. Anderson.*

SOIL SCIENCE

A. G. McCall, *Editor*

(See also in this issue Entries 3655, 3662, 3666, 3667, 3669, 3674, 3681, 3689, 3691, 3693, 3699, 3702, 3705, 3706, 3708, 3798, 3800, 3822, 3825, 3826, 3905, 4069, 4080, 4470, 4472, 4473, 4513, 4517, 4522)

4604. Anonymous. **Sub-soiling. Preliminary report of a trial of sub-soiling devices held at High Hildon, Tonbridge, in October, 1922.** Jour. Ministry Agric. Great Britain **29**: 911–919. 1923.

4605. Amstel, J. E. van. **Algemeen overzicht van ligging en bodem van Suriname. [General review of situation and soil of Surinam.]** West Indie **6**: 18–24. 1921.—A general discussion of the soils of Surinam in relation to agriculture is presented.—*J. C. Th. Uphof.*

4606. Amstel, J. E. van. **Chemisch onderzoek van eenige Surinaamsche kleigronden.** [Chemical observations of some clay soils of Surinam.] Dept. Landb. Suriname Bull. 41. *33 p.* 1921.—The clay soils of Surinam, though apparently uniform, show many differences. Though sticky and plastic when wet, in the dry season they are characterized by their hardness and broad shrinkage checks. They have high water-absorbing power, strong capillarity and evaporating power, and contain a large amount of colloidal silicates. The effect of applications of organic substances, lime, potash, phosphorus, and nitrogen is considered.—*J. C. Th. Uphof.*

4607. Arnhold, Fritz. **Uber die Bedeutung des Schlicks als Mittel zur Pflanzenernährung und Bodenverbesserung.** [On the importance of mud for plant nutrition and soil improvement.] Landw. Jahrb. 58: 205–250. 1923.—Sea mud originates from the interaction during tides of soluble and suspended particles in rivers with salts and suspended matter in sea water, while river mud originates from the settling of suspended matter in the water when the stream velocity diminishes. Sea mud is a uniform mixture of clay, silt, lime, and humus particles with organic matter of plant and animal origin. When fresh it is plastic, fatty, dark brown; when stored it is light gray and has been found useful as a manure and also for plant protection, and for curative purposes in veterinary and human medicine. For manurial purposes 80–100 cubic m. (25,000 kgm.) are applied per hectar, especially on light and peat soils; various plants, especially legumes, are favorably affected.—The mud contains about 7 per cent Ca, 0.8 per cent Mg., 0.2 per cent P_2O_5, and 9.5 per cent N, and consists chiefly of colloidal silicic acid, lime, clay, and humic substances. River mud has a higher content of finer particles, of P and N, but less, K, Mg, and Ca. Sea mud is rich in algae and often contains diatoms, and has a high Ca content due to the presence of shells. Among the bacteria found in the mud are *Azotobacter*, *Radiobacter*, butyric acid and legume bacteria, sulphur bacteria oxidizing H_2S to sulphate, and nitrifying and nitrate-reducing bacteria. The favorable results from mud for soil improvement are due to the influence on the physical condition of the soil, the addition of nutrients, and the introduction of active bacteria.—*S. A. Waksman.*

4608. Baldwin, I. L., U. L. Coble, and J. W. Chamberlain. **Crop rotation as affecting nitrate production.** Proc. Indiana Acad. Sci. 1921: 283–293. Pl. 1. 1922.—Experiments to determine the effect of corn, wheat, oats and soybeans, and crop rotation on the nitrate content and nitrifying power of the soil are described. Results showed that cultivation greatly increased the rate of nitrate formation; that the addition of lime to acid soil improved conditions for the development of nitrifying bacteria; and that the growing crop and the soil treatment are more important than the effect of previous treatment of soil on nitrate production. The rate of nitrate production is not necessarily a limiting factor to plant growth.—*F. C. Anderson.*

4609. Baldwin, I. L., W. E. Walters, and F. K. Schmidt. **Fertilizer treatment as affecting nitrate production.** Proc. Indiana Acad. Sci. 1921: 295–309. 1922.—Experiments showed that cow manure was more efficient than horse manure. "Use of nitrogen with phosphorus or potassium was superior to either of the treatments used alone." Ammonium sulphate-treated samples seemed to show greatest nitrifying power in May, June, and July. There seems to be a correlation "between the amount of nitrate found in the soil under natural conditions with growing crops and the amount accumulating under optimum conditions."—*F. C. Anderson.*

4610. Bertrand, G., et Mokragnatz. **Sur la présence du cobalt et du nickel dans la terre arable.** [The presence of cobalt and nickel in arable land.] Compt. Rend. Acad. Sci. Paris 175: 112–114. 1922.—In the samples of soil studied the cobalt content was 0.0028–0.0039 gm. per kgm. of soil, and the nickel 0.0136–0.0174 gm. per kgm.—*C. H. Farr.*

4611. Fraps, G. S. **Organic constituents of the soil.** Texas Agric. Exp. Sta. Bull. 300. *14 p.* 1922.—The determination of organic carbon in the soil throws little light upon the soil quality and is unnecessary since the percentage can be judged from the percentage of nitro-

gen present. The average percentage of pentosans increases with the average nitrogen content. Pentosans from cottonseed meal disappeared rapidly from the soil during the 1st week. At the end of 8 weeks there were present 7 per cent of the original pentosans from cottonseed meal, 31 per cent from Sudan grass, 61 per cent from rice bran, and 75 per cent from sheep excrement. The amount of reducing substance, calculated as sugars, produced by heating the soil with 1¼ per cent H_2SO_4 varied from 0.002 to 0.215 per cent with an average of 0.058 per cent for 77 soils.—*L. Pace.*

4612. Kelly, J. W. **Probable cause of the toxicity of the so-called poisonous greensand.** Jour. Agric. Res. 23: 223–228. 1923.—An investigation of 3 greensands like those of Newcastle, Virginia, Redbank, New Jersey, and Courtland, Virginia revealed the fact that the last is toxic to corn. The toxicity is due to the solubility of Fe, Mn, and Al in slightly acid media. While the other 2 sands contain these toxic substances in nearly like quantity the presence of marl renders them relatively insoluble. The addition of lime to Courtland greensand inhibits its toxic effects.—*L. Knudson.*

4613. Konig, J., J. Hasenbaumer, und J. Schäfers. **Beziehungen zwischen dem Nährstoffgehalt des Bodens und der Nährstoffaufnahme durch die Kartoffel. [On the relation between the nutrient content of the soil and nutrient absorption by potatoes.]** Land. Jahrb. 58: 55–85. 1923.—One per cent citric acid extraction furnishes a good index of the content of readily available K and phosphoric acid in the soil. It is important to allow enough citric acid for the $CaCO_3$ present in the soil. The relation between K, N, and phosphoric acid for a proper crop of potatoes should be 100:70:25. The actual amount of fertilizer needed can be determined from the relative composition of a good crop of potatoes and fertilizing elements available. Each 1000 gm. of weight of a normal potato crop requires approximately 25 gm. K, 18 gm. N, and 6 gm. P_2O_5.—*S. A. Waksman.*

4614. Konig, J., J. Hasenbaumer, und E. Kroger. **Beziehungen zwischen dem Nährstoffgehalt des Bodens und der Nährstoffaufnahme durch den Hafer nebst einem Beitrag über den Einflusz von Pflanzen und Düngern auf die Bodensäure. [On the relation between the nutrient content of the soil and the absorption of nutrients by oats, with a contribution on the influence of plants and manures upon soil acidity.]** Landw. Jahrb. 58: 87–124. 1923.—The quantities of artificial fertilizer used in practice are sufficient to exert an influence upon the soil reaction which can be measured, after a certain time, by determining electrometrically or colorimetrically the H-ion concentration in the soil. Growing plants also influence the reaction of the soil. In general, plants increase the acidity of the soil, the degree of change depending on the kind of plant. In the presence of $CaCO_3$ the acids secreted by the plants are neutralized and can thus not be determined. This indicates that alkaline or neutral fertilizing salts should be used for acid soils; in the case of a very high acidity, the favorable influence of the fertilizer is apparent only after a sufficient addition of lime. Alkali soils require physiologically acid salts.—*S. A. Waksman.*

4615. Mazé, P. **Sur les conditions pratique de l'emploi de la cyanamide calcique comme engrais. [On practical conditions in the use of calcium cyanamide as fertilizer.]** Compt. Rend. Acad. Sci. Paris 175: 1093–1096. 1922.—This compound is transformed into urea in the soil by microorganisms. To avoid toxic effects it must be put in the soil several days before seeding. Records given of the yields of wheat and oats show favorable results for this fertilizer, an application at the rate of 40 kg. of N per hectare giving the best results.—*C. H. Farr.*

4616. Mitscherlich, E. A., [with the assistance of] F. During, C. Krull, S. V. Saucken, und K. Bohm. **Der Düngerversuch (Gefäss- und freiland Versuch). [Fertilizer experiments —pot and field experiments.]** Land. Jahrb. 58: 125–158. 1923.—Field experiments present advantages over pot experiments in that plants can be grown to maturity in the same soil. There are, however, many disadvantages, especially the physical and chemical variability of the soil, which may lead to comparatively large errors. This can be obviated by using large

numbers of small plots. Since field tests may suffer from weeds, plants should be selected which require cultivation and which, like potatoes, give large yields. The experimental error can thus be reduced to 1–2 per cent. But due to the lack of uniformity of the soil, the particular experiment holds true only for the particular part of the field. Also, in certain years an unfavorable growth factor (drought) interferes with field experiments yielding conclusive results.—Pot experiments have the advantage that the growth factors, like water, heat, light, and nutrients, can be controlled, and the soil made more representative and uniform. Disadvantages are that the soil is not comparable with the same soil under field conditions, and wrong conclusions may be drawn, and that plants giving greatest yields can not be used because of space required.—Pot experiments are reported on the influence of the N, K, and P fertilizers on oats. The authors conclude that pot experiments should be carried out on a large scale to determine the fertilizer need of the soil. To enable him to use fertilizers most rationally, each farmer is entitled to have his soil properly investigated.—*S. A. Waksman.*

4617. Petit, A. **Sur la nocuite du terreau du fumier. [Concerning the noxiousness of manure compost.]** Compt. Rend. Acad. Sci. Paris **174:** 1362–1364. 1922.—A previous report indicated that manure is a more effective fertilizer after it is leached. Some plants, as *Primula obconica*, are not benefited by such treatment, while others, such as Cineraria hybrids, are even injured. It is found that calcium increases the injurious effect of the fertilizer and iron reduces it.—*C. H. Farr.*

4618. Romell, Lars-Gunnar. **Luftväxlingen i marken som ekologisk faktor. [Aeration of the soil as an ecological factor.]** Meddel. Statens Skogsförsöksanst. **19:** 125–359. *Fig. 1–6.* 1922.—Movement of gases through the soil takes place primarily by diffusion, the rate being little affected by soil structure or by weather, except that it is greatly reduced in clays and in waterlogged soils. The author finds that a surface layer of organic matter promotes aeration while on bare soils torrential rains may cause a sealing of the surface pores with fine material. A cover of leaf litter, moss, or similar material prevents such action which hinders aeration. On the well-drained moraines and sandy forest soils of Sweden, aeration is not a problem, while waterlogged soils are liable to be poorly aerated. Drainage opens the way for the entrance of oxygen, but the removal of moss and litter is unnecessary, or even harmful. [Summary in German.]—*G. A. Pearson.*

4619. Russell, Edward J. **Soil conditions and plant growth.** *4th ed., xii + 406 p., 32 fig.* Longmans, Green and Co.: London, 1921.—The general characteristics of the older editions are retained, the subjects being treated broadly and outlines emphasized. This edition is included in a new series, The Rothamsted Monographs on Agricultural Science. I. Historical and introductory. Development of agriculture from Roman to modern times is treated. During this period the agricultural chemist is acquiring a taste for mathematical formulae and constants unknown to the older generation of workers.—II. Soil conditions affecting plant growth. Such conditions as water and air supply, temperature, and especially the effect of different chemical elements, singly and combined, are discussed.—III. The composition of the soil. The main topics considered are: (1) mineral matter derived from rock material with their physical properties and soil acidity; (2) calcium carbonate and phosphate derived from decomposed organisms; (3) soil solution; (4) organic matter.—IV. The colloidal properties of soil. Relations of soil colloids to absorption of water and the chemicals in the soil solution, and their relation to flocculation of clay and silt and the formation of hard pan are developed. The central part of the thesis is that soil phenomena are dynamic and not static.—V. The carbon and nitrogen cycles in the soil. The decomposition of carbon compounds, the fixation of nitrogen, and denitrification are emphasized and attention called to a number of suggestive lines of work. The biological hypothesis explaining such transformation "remains the simplest and most satisfactory, but there is room for more evidence before it can be regarded as positively established."—VI. The biological conditions in the soil. Water supply is discussed from the point of view of the plant physiologist and ecologist and of the soil physicist. "The soil solution may safely be regarded as the minimum food supply, which is

reinforced to an unknown extent by the soluble substances in the soil." Emphasis is placed on the fact that the soil organisms live on a highly "colloidal complex of organic and inorganic compounds, usually more or less saturated with water, that envelopes the mineral particles. There is no evidence of the presence of soluble toxins in normally aerated soils sufficiently supplied with plant food and with calcium carbonate, but toxins may occur on 'sour' soils badly aerated and lacking in calcium carbonate or on exhausted soils."—VII. The microorganic population of the soil and its relation to the growth of plants. Algae, fungi, Actinomyces, and bacteria, are regarded as leading their own lives and are not classified as in previous editions according to their usefulness to higher plants. Investigation on the partial sterilization of soil is discussed in connection with soil protozoa.—VIII. The soil in relation to plant growth. Attention is called to the relationship of vegetation to the 5 great soil divisions, clays, loams, sands, calcareous soils, and soils rich in organic matter.—IX. Soil analysis and its interpretation. Soil analysis is restricted to a comparison of soils and to a correlation between "the chemical and physical properties of the soils of a given area and the crops and agricultural methods generally associated with them."—Appendices include a description of methods of soil analysis and tables showing amounts of various substances absorbed from the soil by the common agricultural crops of England. A selected biography of 323 papers on soil conditions and plant growth, and author and subject indices follow.—*Earl S. Johnston.*

4620. Russell, John. **The possibility of using town refuse as manure.** Jour. Ministry Agric. Great Britain **29:** 685–691. 1922.

4621. Tulaikov, N. **Drought and the means of overcoming its evil effects in the Volga region of European Russia.** Jour. Amer. Soc. Agron. **15:** 6–15. 1923.—An efficient system of field agriculture, introduction of methods of cultivation used by the experiment stations, improvements of methods in all branches of agriculture, and use of water resources are suggested to combat the evil effects of drought in southeastern Russia.—*F. M. Schertz.*

4622. Vernadsky, W. J. **Sur le problème de la décomposition du kaolin par les organismes [The problem of the decomposition of kaolin by organisms.]** Compt. Rend. Acad. Sci. Paris **175:** 450–452. 1922.—Murray and Irvine reported that diatoms could live successfully in water free of silicon, if it contained a small amount of clay. The author points out that the decomposition of clay liberating silicon is a chemical reaction requiring a large amount of energy, such as a temperature of 1000°C., or the action of strong acids, like H_2SO_4. A study was made of the effect of diatoms and accompanying bacteria upon the decomposition of argilaceous soils to form free aluminium hydrates. It is not determined as yet whether the reaction is the result of the work of the bacteria, the diatoms, or their symbiosis.—*C. H. Farr.*

4623. Vincent, V. **Sur la mesure de l'acidité des sols par les liqueurs alcalines. [On the measurement of the acidity of soils by alkaline solutions.]** Compt. Rend. Acad. Sci. Paris **175:** 1233–1234. 1922.—Calcium hydrate, sodium bicarbonate, and calcium bicarbonate were used. It is found that calcium hydrate is preferable since in soils treated with this solution the ferric hydrate, aluminium hydrate, and silicon hydrate are precipitated.—*C. H. Farr.*

4624. Voicu, J. **Influence de l'humus sur la sensibilité de l'Azotobacter Chroococcum vis-à-vis du bore. [The influence of humus on the sensitivity of Azobacter Chroococcum to boron.]** Compt. Rend. Acad. Sci. Paris **175:** 317–319. 1922.—It was found that the total amount of nitrogen fixed was greater without boron, but boron may occasionally increase the amount of nitrogen fixed per gm. of sugar consumed. Humus was found to increase markedly the amount of nitrogen fixed, the sugar consumed, and the nitrogen fixed per gm. of sugar consumed. The retardative effect of boron is more marked in the presence of humus.—*C. H. Farr.*

4625. Wenholz, H. **Some recent views on the liming of soils.** Agric. Gaz. New South Wales **34:** 7–13. 1923.—It is pointed out that the soils of Australia present unique problems from the standpoint of the use of lime.—*L. R. Waldron.*

4626. Zunker, F. **Die Bestimmung der spezifischen Oberfläche des Bodens.** [The determination of the specific surface of the soil.] Landw. Jahrb. 58: 159–205. 1923.—The specific surface is a general measure of the degree of division of a substance. Penetrability of water in the soil, which determines the distance between the drains, is a function of the specific surface. Various formulae are developed for the determination of the specific surface. Practically it is carried out as follows: soil samples (1 kgm.) are taken at a depth of 0.5, 1.0, and 1.5 m., and air dried. The soil in each sample is mixed and larger stones separated out; 300 cc. of distilled H_2O and 30 cc. of normal ammonia solution are added to 200–300 gm. of sandy loams, 100–150 gm. of loams, 50–100 gm. of clays, and 50 gm. of heavy clays taken in parallels, the moisture having been determined. These remain 24 hours, are shaken 2 hours in a rotating apparatus, and after standing a few seconds the suspension is poured off from sediment; more distilled water is added to the latter to free it from finer particles; the sediment is then dried and weighed. The suspension is diluted and specific weight determined by means of a special apparatus. By using a formula ($U = \frac{6.971}{\sqrt{T_o}} \cdot \frac{G\%}{H} \cdot F^1$), the specific surface is obtained. The distance of the drains is then determined from the specific surface of the soil.—*S. A. Waksman.*

TAXONOMY OF VASCULAR PLANTS

J. M. Greenman, *Editor*

E. B. Payson, *Assistant Editor*

(See also in this issue Entries 3779, 3816, 3827, 3978, 3979, 4081, 4092, 4097, 4120, 4128, 4147, 4391)

GENERAL

4627. Black, J. M. **Flora of South Australia. Part I. Cyatheaceae-Orchidaceae.** *8vo, 154 p., 19 pl., 34 fig.* R. E. E. Rogers: Adelaide, 1922.—This publication is the first af a series of handbooks of the flora and fauna of South Australia, issued by the British Science Guild (South Australian Branch). The treatment of the Orchidaceae in the present part is contributed by R. S. Rogers. Following the author's preface are short chapters on the history of botany in South Australia and a glossary of botanical terms. Dichotomous keys lead to the families, genera, and species, and each category is briefly characterized. The geographical range of the species is given and the time of flowering and fruiting of each species is also indicated. The following names are definitely indicated as new combinations: *Leptochloa digitata* (*Eleusine digitata* Spreng.), *Cladium tetragonum* (*Lepidosperma tetragona* Labill.), and *Dichopogon fimbriatus* (*Arthropodium fimbriatum* R. Br.).—*J. M. Greenman.*

4628. Gambier-Parry, T. [Rev. of: Skene, Macgregor. **Common plants.** *8vo., 271 p.* A. Melrose: London and New York.] Rept. Bot. Soc. and Exchange Club British Isles 6: 350. 1921. [1922].—[See also Bot. Absts. 11, Entry 1085.]

4629. Hitchcock, A. S. **Remarks on Mr. Sprague's suggestion.** Science 57: 209. 1923.—The author expresses his willingness to accept the compromise suggested by T. A. Sprague [see Bot. Absts. 12, Entry 4634] to harmonize the Type-basis Code and the International Rules of Nomenclature. He also requests that taxonomic botanists submit statements of their views on such a compromise in the hope that all those concerned will be prepared for action at the next International Botanical Congress.—*C. J. Lyon.*

4630. Knoche, Herman. **Flora Balearica. Étude phytogéographique sur les Isles Baléares.** [Flora of Balearica. Phytogeographical study of the Balearic Islands.] Vol. II. *Roy. 8vo, 585 p.* Roumégous and Déhan: Montpellier, 1922.—This volume continues on the same plan as the first one and includes the natural groups from *Laurus* of the Lauraceae to *Scorzonera* of the Compositae. The following new species, names, varieties, and combinations

are included: *Umbilicus vulgaris* L. var. *pendulinus* (*U. pendulinus* DC.), *U. vulgaris* L.var. *gaditanus* (*U. gaditanus* Pau & Pons-Guer.), *Genista acanthoclada* DC. var. *fasciculata*, *Anthyllis Vulneraria* L. var. *balearica* (*A. balearica* Coss.), *Ruta chalepensis* L. var. *bracteosa* (*R. bracteosa* DC.), *Euphorbia Maresii* (*E. Gayii* Mar. & V., not Salis) and var. *balearica* (*E. Gayii* var. *balearica* Willk.) and var. *minoricensis* (*E. Gayi* Porta,not Salis), *Viola odorata* L. var. *alba* (*V. alba* Becker), *Bupleurum fruticescens* L. var. *Barceloi* (*B. Barceloi* Cosson), *Pimpinella Tragium* Vill. var. *balearica*, *Adarianta Bicknellii*, *Ligusticum pyrenaicum* Gouan. var. *Huteri* (*L. Huteri* Porta), *Primula acaulis* (L.) var. *alba*, *Statice virgata* Willd. var. *minuta* (*S. minuta* L.), *Teucrium Polium* L. *var. majoricum* (*T. majoricum* Rouy), *Calamintha Nepeta* Savi var. *glandulosa* (*C. glandulosa* Benth.), *Micromeria biflora* Benth var. *Rodriguezii* (*M. Rodriguezii* Freyn. & Janka), *Thymus Serpyllum* L. var. *Richardii* (*T. Richardii* Pers.), *Verbascum Boerhavi* L. var. *Portae* (*V. Portar* Willk.), *Chaenorrhinum organifolium* Lange var. *formenterea* (*C. Formenterae* Gand.), *C. rubifolium* Willk. & Lange var. *Bianorii*, *Digitalis purpurea* L. subsp. *dubia* (*D. rubia* Rod.), *Sibthorpia balearica* (*S. africana* Bourg. not L.), *Plantago Psyllium* L. var. *dubia*, *Galium rubrum* L. var. *balearicum*, *Cephalaria rigida* (L.) Schrad. var. *balearica*, *Cirsium lanceolatum* (L.) Scop. var. *echinatum* (*C. echinatum* (DC.), *Centaurea Calcitrapa* L. var. *myacantha* (*C. myacantha* DC.), *C. dianae* (*Carduncellus dianius* Webb.), and *Leontodon hirtus* L. var. *hispida* (*Thrincia hispida* Rod.). IBID. Vol IV. *1–47 pl., maps 3–5, and frontispiece.* 1923.—This volume contains illustrations of about 50 species and varieties of plants and a number of reproduced photographs showing characteristic views of natural vegetation, particularly on the island of Majorca.—*J. M. Greenman.*

4631. Miyabe, Kingo, and Yushun Kudo. Icones of the essential forest trees of Hokkaido. Folio. Fasc. 7, *pl. 20–22.* May, 1922; fasc. 8, *pl. 23–25*, Aug., 1922; fasc. 9, *pl. 26–28*, Feb., 1923. Published by the Hokkaido Government.—The present fascicles contain descriptions and colored illustrations of 9 species of trees including 1 variety, 3 in each fascicle. These are: *Juglans Sieboldiana* Maxim., *Pterocarya rhoifolia* Sieb. & Zucc., and *Carpinus cordata* Bl.; *C. laxiflora* Blume, *Ostrya japonica* Sarg., *Betula Maximowicziana* Rgl.; *B. Ermanii* Cham., *B. japonica* Sieb., and *Alnus japonica* Sieb. & Zucc. var. *arguta* Call. A very full bibliography and synonomy are given in each case.—*J. M. Greenman.*

4632. Pearsall, W. H. [Rev. of: Moss, C. E. The Cambridge British flora. Vol. III. Portulacaceae to Fumariaceae. xvi + 200 p. Cambridge University Press: 1920 (see Bot. Absts. 8, Entry 2232).] Rept. Bot. Soc. and Exchange Club British Isles 6: 75–79. 1920 [1921].—[See also Bot. Absts. 9, Entry 1078; 10, Entry 335.]

4633. Schaffner, John H. Field manual of trees including southern Canada and northern United States to the southern boundary of Virginia, Kentucky and Missouri, westward to the limits of the prairie. *2nd ed., small 8vo, 154 p.* R. G. Adams & Co.: Columbus, 1922.—The present edition remains substantially the same as the one published in 1914. Certain corrections and a few minor changes only have been made. Two keys to the genera are given; one is based mainly on leaf and twig characters of the plant in the summer condition, the other chiefly on twig and stem characters in the winter condition. Each genus is briefly characterized, and under the larger genera keys to the species are included. Habitat and general geographical distribution are indicated.—*J. M. Greenman.*

4634. Sprague, T. A. Suggestions for a world-code of plant nomenclature. Science 57: 207–208. 1923.—The author proposes a compromise between the Type-basis Code (Science 49: 333. 1919; 53: 312. 1921) and the International Rules of Botanical Nomenclature. Recent discussions in The Journal of Botany (1921 & 1922) have pointed out differences between the 2 codes and the resulting handicaps to systematic botany. Nine definite suggestions are given, and their acceptance is urged by both sides. Such action would involve sacrifices by both sides but would lead to harmony and 1 set of rules for all [See also Bot. Absts. 12, Entry 4629.]—*C. J. Lyon.*

4635. Wu, Y. T. [The criterion for classification of plants.] Ko-Hsueh [Science-Publ. Chinese Sci. Soc.] 7: 785–797. 1922. [Text in Chinese.]—A treatise is presented on the general principles in classifying plants.—*Chunjen C. Chen.*

PTERIDOPHYTES

4636. Blatter, E., and J. F. d'Almeida. **The ferns of Bombay.** *Small 8vo, viii + 228 p., 15 pl., 42 fig., and frontispiece.* D. B. Taraporevala Sons & Co.: Bombay, 1922.—This work is a popular presentation of the ferns of the Bombay Presidency. A synoptical key to 54 genera is given, as well as keys to the species under the larger genera. *Ophioglossum Aitchisoni* d'Almeida is described and illustrated as new to science. [See also following entry.]—*J. M. Greenman.*

4637. Britton, E. G. [Rev. of: Blatter, E., and J. F. d'Almeida. **The ferns of Bombay.** *viii + 228 p., 15 pl., 42 fig., and frontispiece.* D. B. Taraporevala Sons & Co.: Bombay, 1922 (see preceding entry).] Torreya 23: 11. 1923.

4638. Graves, E. W. **An interesting trip.** Amer. Fern Jour. 11: 86–88. 1921.—The trip was made in May, 1917, to Bucks Pocket, Alabama, to collect specimens of *Trichomanes Petersii* Gray. Eight species of ferns and a number of angiosperms were seen.—*F. C. Anderson.*

4639. Herter, W. **Lycopodiaceae borneenses.** [Lycopodiaceae of Borneo.] Philippine Jour. Sci. 22: 179–184. 1923.—Twelve species of *Urostachys* and 3 of *Lycopodium* are recognized as occurring in Borneo. The following new combinations, species, and varieties appear: *Urostachys Selago* (*Lycopodium Selago* L.), *U. borneensis*, *U. nummulariifolius* (*L. nummulariifolium* Blume), *U. Hellwigi* (*L. Hellwigi* Warb.), *U. Lauterbachi* (*L. Lauterbachi* Pritz.), and *Lycopodium cernuum* Linn. vars. *typica*, *longiflora*, and *vulcanicum*.—*E. D. Merrill.*

4640. Herter, W. **Lycopodiaceae philippinenses.** [Lycopodiaceae of the Philippines.] Philippine Jour. Sci. 22: 57–76. 1923.—Two genera, *Urostachys* with 15, and *Lycopodium* with 7 species are recognized. Keys to the genera and species are given. The following are new: *Urostachys minimus*, *U. Whitfordi*, *U. Toppingi*, *U. Merrilli*, *U. Elmeri*, *U. banayanicus*, *U. salviniodes*, and *U. Delbruckii*. By transfer from *Lycopodium* the following new combinations appear: *Urostachys serratus* (Thunb.), *U. verticellatus* (Linn. f.), *U. squarrosus* (Forst.), *U. Magnusianus* (Hert.), *U. carinatus* (Desv.), *U. pinifolius* (Blume), and *U. phlegmaria* (Linn.). The paper closes with a comprehensive consideration of the geographic distribution of the various species.—*E. D. Merrill.*

4641. Hunter, Mabel R. **The present status of Scolopendrium in New York state.** Amer. Jour. Bot. 9: 28–36. *2 fig.* 1922.—The 4 stations previously reported for *Scolopendrium vulgare* Sm. in central New York were located and the species found to be still present there. Two new substations were discovered. Evidence is presented through counts of individual plants in 1916 and 1921 that this fern is becoming somewhat more abundant.—*E. W. Sinnott.*

4642. Knowlton, C. H., W. S. Ripley, Jr., and C. A. Weatherby. **Third report of the Committee on Floral Areas.** Rhodora 23: 209–220. 1921.—This report covers the Ophioglossaceae, Marsileaceae, Salviniaceae, Equisetaceae, Lycopodiaceae, and Selaginellaceae, and is published as a part of the Preliminary Lists of New England Plants. A table gives the distribution of the plants by states; they are further classified into geographical and ecological groups.—*James P. Poole.*

4643. Lewis, Charles S., and William F. Lewis. **A list of ferns found in New Hanpshire.** Amer. Fern Jour. 11: 82–85. 1921.—The list consists of 34 species distributed among 14 genera 10 varieties, and 5 hybrids. The ferns were collected during the summer of 1916, near Melvin Village including Mt. Shaw and near North Woodstock; and during summer, 1918, near Whitefield and the Presidential Range including Mt. Washington.—*F. C. Anderson.*

4644. Marshall, M. A. **Proliferous ebony spleenwort.** Amer. Fern Jour. **13**: 7–13. *Pl. 1.* 1923.—Growing in the basement of Woodstock Academy, Woodstock, Connecticut was found a colony of *Asplenium platyneuron* (L.) Oakes with small plants growing on the stipes of many of the plants.—*F. C. Anderson.*

4645. Munz, Philip A., and Ivan M. Johnson. **The distribution of southern California pteridophytes.** Amer. Fern. Jour. **13**: 1–7. 1923.—The Selaginellaceae and Equisetaceae are discussed. This is the conclusion of a paper begun earlier [see Bot. Absts. 12, Entry 2858].—*F. C. Anderson.*

4646. Rugg, Harold Goddard. **Adiantum pedatum var. aleuticum in New England.** Amer. Fern Jour. **12**: 128–130. *Pl. 8.* 1922.—The new station recorded for this species is near Montgomery Center, Vermont.—*F. C. Anderson.*

4647. Tilton, George H. **The fern lover's companion.** *Pocket size, 240 p, 159 illus.* Originally published by the author: Melrose, Massachusetts, 1922 (now in the hands of Little, Brown & Co., Boston).—This is a book for amateurs. A brief account of reproduction in ferns, explanations of some of their characters and of the corresponding descriptive terms, and directions for making herbarium specimens are given, with an illustrated key to the genera. Then follow brief, nontechnical descriptions of the (82) species of Eufilicineae and Ophioglossales in the Gray's Manual region, with habitat and range data and miscellaneous information. The English names commonly used are given for all species; the Latin nomenclature follows in the main that the 7th edition of Gray's Manual, with synonymy covering fairly well usage in the U. S. A. back to 1890. Names such as *Pteretis nodulosa*, which have come into use since the publication of the 7th edition are shown in distinctive type. The descriptive part is followed by short biographical sketches of 10 "fern authors," a bibliography, a list of times of fruiting of different species, a glossary of technical terms, and a check-list of the Latin names.—*C. A. Weatherby.*

4648. Wheeler, Leston A. **Botrychium obliquum, var. dissectum in Vermont.** Amer. Fern Jour. **12**: 127–128. 1922.

4649. Wherry, Edgar T. **Wall ferns in Wilmington, North Carolina.** Amer. Fern Jour. **13**: 17–18. *1 fig.* 1923.—*Pteris multifida* Poiret and *Adiantum Capillus-Veneris* L. were found growing on walls.—*F. C. Anderson.*

SPERMATOPHYTES

4650. Anonymous. **Feijoa Sellowiana.** Amer. Bot. **29**: 13–15. 1923.—The article gives a brief description and illustration of the fruit of the South American *Feijoa Sellowiana.*—*Susan P. Nichols.*

4651. Bailey, L. H. **Two species of Hibiscus from China.** Gentes Herbarum **1**: 109–110. *Fig. 50.* 1922.—The new species described are *Hibiscus sinosyriacus* and *H. paramutabilis.*—*Alfred Rehder.*

4652. Burkill, I. H., and F. W. Foxworthy. **Notes on Dipterocarps. No. 6. On the genus Pachynocarpus.** Jour. Straits Branch Roy. Asiatic Soc. No. 86, p. 271–280. 1922.—The genus *Pachynocarpus* is overgrown and should surrender to *Vatica; P. Wallichii* King, *P. ruminatas* Brandis, and *P. Ridleyanus* J. W. Anderson become *V. Wallichii* Dyer, *V. ruminata* Burck, and *V. Ridleyana* Brandis. *Pachynocarpus* is then left with two species, *P. umbonatus* Hook. f., of Borneo, which should be sought for and reëxamined, and *P. Stapfianus* King, which occurs in the Malay Peninsula from Lower Siam to Selanger and Pahang. The known distribution of *Vatica Wallichii* is given; and to it *V. obtusifolia* Ridl. and *V. Kelsalli* Ridl. are reduced. Its fruits are distributed by water.—*I. H. Burkill.*

4653. Hu, H. H. [The two newly-discovered plants of Chekiang province.] Ko-Hsueh [Science-Publ. Chinese Sci. Soc.] 7: 608–612. *Pl. 1–2.* 1922. [Text in Chinese.]—*Rubus Hui* and *Mollinia Hui*, among the author's collection of plants in Chekiang, have been identified and determined as new species by Diels and Pilger respectively. Descriptions in Chinese and Latin are appended.—*Chunjen C. Chen.*

4654. Hutchinson, J. **A contribution to the flora of northern Nigeria.** Kew Bull. 1921: 353–407. *Fig. 1–10.* 1921.—This is an annotated catalogue of plants collected by H. V. Lely on the Bauchi Plateau, a region but little known botanically. The following species are described as new: *Artabotrys nigericus, Cissus Lelyi, Crotalaria crepitans, C. naragutensis, Smithia speciosa, Vigna longissima, Dissotis graminicola, D. cinerascens, Pycnocycla occidentalis, Pentas globifera, Vernonia saussureoides, Coreopsis camporum, Senecio Lelyi, Centaurea nigerica, Maba secundiflora, Margaretta inopinata, Ceropegia pedunculata* Turrile, *Peristrophe pilosa, Clerodendron Lelyi, Acrocephalus alboviridis, Protea argyrophaea, Eulophia propinqua, Satyrium nigericum,* and *Lapeyrousia montana.—T. J. Fitzpatrick.*

4655. Mackenzie, Kenneth Kent. **Notes on Carex-XII.** Bull. Torrey Bot. Club 49: 361–373. 1922.—*Carex Richii* (Fernald) Mackenzie, *C. cumulata* (Bailey) Mackenzie, and *C. Merritt-Fernaldii* Mackenzie are described as new species. *Carex Longii* Mackenzie is a new name given to the plant which has recently been treated as *C. albolutescens* Schw., the type specimen of the latter having been shown to be a plant of *C. straminea Schk.—P. A. Munz.*

4656. Merrill, Elmer D. **New or noteworthy Bornean plants.** Jour. Straits Branch Roy. Asiatic Soc. No. 85, p. 151–201. 1922.—The following new genera, species, and combinations are published: *Pandanus sandakanensis, P. Matthewsii, P. obovoideus, P. pachyphyllus, Mapania sessilis, M. affinis, M. gracilipes, M. heterocephala, Schismatoglottis ferruginea, Pleomele borneensis, Smilax gigantea, S. Woodii, Curculigo borneensis, Phrynium inflatum, Artocarpus Clementis, A. borneensis, A. peltata, Laportea oblanceolata,* Fissipetalum n. gen. (Olacaceae), *F. borneense,* Juppia *n. gen.* (Menispermaceae), *J. borneensis, Tinospora glandulosa, Cyclea caudata, Talauma megalophylla, T. borneensis, Artabotrys Clementis, A. borneensis, A. trichopetalus, A. trigyna, Fissistigma Clementis, Oxymitra grandifolia, O. acuminata, Goniothalamus stenophyllus, G. nitidus, G. dolichocarpus, Polyalthia tenuipes, P. xanthopetala, Phaeanthus impressinervius,* Woodiella n. gen. (Anonaceae), *W. sympetala, Knema Winkleri, K. oblongata, K. nitida, Actinodaphne diversifolia, Litsea cuprea, L. caulocarpa, L. sandakanensis, L. megalophylla, L. elliptibacca, Agelaea Agamae, A sarawakensis, A. Woodii, and Connarus euphlebius.*

The following old species are added to the flora of Borneo: *Themeda frondosa* Merr., *Panicum carinatum* Presl, *P. distachyum* Linn., *Dinochloa pubiramea* Gamble, *Cyperus procerus* Rottb., *Forrestia glabrata* Hassk., *Curculigo glabrescens* (*C. latifolia* Dry. var. *glabrescens* Ridl.), *Dioscorea flabellifolia* Prain & Burkill, *Phacelophrynium bracteosum* K. Schum., *Helicia excelsa* Blume, *Viscum angulatum* Heyne, *Polyalthia dolichophylla* Merr., *P. subcordata* Blume, *P. lateriflora* (Blume) King, *Popowia velutina* King, *Uvaria micrantha* (DC.) Hook. f., *Litsea grandis* (Wall.) Hook. f., *L. megacarpa* Gamble, *L. bancana* (Miq.) Boerl., *L. odorifera* Valeton, *Dehaasia triandra* Merr., *Lindera malaccensis* Hook. f., *Illigera celebica* Miq., *Polyosma integrifolia* Blume, and *Cnestis palala* (*Thysanus palala* Lour.).—*I. H. Burkill.*

4657. Merrill, Elmer D. **New or noteworthy Bornean plants. Part II.** Jour. Straits Branch Roy. Asiatic Soc. No. 86, p. 312–342. 1922.—Descriptions of the following new species are published: *Derris pachycarpa, Canavalia bracteolata, Sarcotheca pinnata, Evodia punctata, Chisochiton brachyanthum, C. kinabaluensis, Aglaia baramensis, Glochidion lancisepalum, Galearia stenophylla, G. sessiliflora, Melanochyla ferruginea, Semecarpus borneensis, S. oblanceolata, Salacia nitidissima, Phytocrene anomala, Elaeocarpus brevipes, Grewia pyriformis, Sterculia trichopetiolata, Saurauia amplifolia, Gordonia grandiflora, Taraktogenos grandiflora, Casearia borneensis, Begonia angustilimba, Eugenia sandakanensis, E. Woodii, Myrtus Moul-*

tonii, Melastoma laevifolium, Dalenia pubescens, Dissochaeta Ramosii, Kibessia verrucosa, and Alangium borneense. The names *Actinidia latifolia* and *Gordonia amboinensis* are proposed for *Actinidia Champoioni* Benth. and *Laplacea amboinensis* Miq., respectively, and the first is added to the list of known Bornean plants. The following are also added to the list: *Evodia bintoca* Blanco, *Aphanamixis sumatrana* Harms, *Santiria samarensis* Merr., *Canarium pseudocommune* Hochr., *Dichapetalum holopetalum* Merr., *Homonoia javensis* Muell. Arg., *Mallotus Blumeanus* Muell. Arg., *M. Moritzianus* Muell. Arg., *Actephila dispersa* Merr., *Cleistanthus megacarpus* C. B. Rob., *Omphalea bracteata* (Blanco) Merr., *Salacia oblongifolia* Blume, *Iodes philippinensis* Merr., *Neesia synandra* Mast., *Boschia Griffithii* Mast., *Linostoma pauciflorum* Griff., *Eugenia palawanensis* C. B. Rob., *Clidemia hirta* (*Linn.*) *D. Don,* and *Pachycentria constricta* Blume.—*I. H. Burkill.*

4658. Munz, Philip A., and Ivan M. Johnston. **Miscellaneous notes on plants of southern California—II.** Bull. Torrey Bot. Club **49:** 349–359. 1922.—Species new to southern California and extensions of range for others are mentioned. The following nomenclatorial changes and additions are made: *Phoradendron californicum* var. *distans* f. *leucocarpum* Trelease f. nov., *Eriogonum nodosum* var. *Jaegeri* var. nov., *Eriogonum fasciculatum* var. *flavoviride* var. nov., *Scopulophila Rixfordii* (Brandegee) comb. nov., *Claytonia lanceolata* var. *Peirsonii* var. nov., *Draba corrugata* var. *saxosa* (Davidson) comb. nov., *Sphaeralcea rosacea* sp. nov., *Oenothera cardiophylla* var. *splendens* var. nov., *Asclepias eriocarpa* var. *microcarpa* var. nov., *Phlox bernardina* sp. nov., *Penstemon Clevelandi* var. *connatus* var. nov., *Galium angustifolium* var. *pinetorum* var. nov., and *G. Hallii* sp. nov.—*P. A. Munz.*

4659. Pennell, Francis W. **Some overlooked Scrophulariaceae of Rafinesque.** Torreya **22:** 77–84. 1922.—The author's review of the Scrophulariaceae [see Bot. Absts. 3, Entry 3013; 5, 2392, 2393, 2393; 6, 436] is supplemented by a list of names published by Rafinesque in works so rare that they have not yet been catalogued. Twenty-seven species and varieties from the Autikon Botanikon and one from the American Monthly Magazine are listed and referred to their modern equivalents. Two new combinations are published: *Mecardonia acuminata* (Walt.) Small var. *microphylla* (Raf.) Pennell, and *Scrophularia lanceolata* Pursh var. *occidentalis* (Rydb.) Pennell.—*J. C. Nelson.*

4660. Ridley, H. N. **New and rare Malayan plants. Series XII.** Jour. Straits Branch Roy. Asiatic Soc. No. 86 pp. 292–311. 1922.—The following new species and varieties are described: *Turraea brevi flora, Zizyphus pernettyoides, Eugenia alata, Trevesia rufo-setosa, Tarenna calcarea, Pavetta graciliflora* Wall., *P. pauciflora, Psychotria lanceolaria, P. atroviridis, Cephaelis melanocarpa, Borreria pilulifera, B. parviceps, Embelia subcordata, Ervatamia pauciflora, E. pauciflora* var. *minor, Hoya citrina, Cynanchum Seimundii, Gaertnera ovata, G. rigida, Didissandra castaneaefolia, Didymocarpus castaneaefolia, Loxocarpus minimus, Cyrtandra patula, Ebermaiera longispica, Strobilanthes latebrosa, S. leucopogon, Barleria siamensis* Craib var. *glabrescens, Gymnostachyum Robinsonii, Eranthemum candidum, Justicia Robinsonii, J. microcarpa, Sphinctacanthus malayanus, Elytranthe tubaeflora, Ficus patens, Elatostemma inaequilobum, Thrixspermum iodochilus, Neuwiedia ocrea, Alpinia campanaria, A. Seimundii, Amomum spiceum, Amorphophallus elegans, Pothosa, lorispatha, Areca latiloba, Pinanga glaucescens* and *Pandanus pilaris.* The following new combinations appear: *Pavetta indica* var. *canescens* (*P. canescens* Wall.), *Borreria laevicaulis* (*Bigelovia laevicaulis* Miq.), *B. setidens* (*Bigelovia setidens* Miq.), and *Kaempferia cyanescens* (*Elettariopsis cyanescens* Ridl.). The following are recorded as occurring in the Malay Peninsula: *Polygala pulchra* Hassk., *Pavetta tomentosa* Roxb., *P. graciliflora* Wall., *Borreria latifolia* K. Schum., and *B. hispida,* K. Schum. Lastly there is a note upon the occurrence inland of *Ipomoea Pescaprae* Roth.—*I. H. Burkill.*

4661. Rose, J. N. **Byrnesia Weinbergii.** Addisonia **7:** 37, 38. *Pl. 243* (*col.*). 1922.—This ornamental Crassulaceous herb, recently introduced is made the type of a new genus **Byrenesia,** which is here proposed. The plant is probably Mexican.—*T. J. Fitzpatrick.*

4662. Rose, J. N. **Eucrosia Morleyana.** Addisonia 7: 3, 4. *Pl. 226 (col.).* 1922.—This herb of the Amaryllidaceae is here described as new. The type locality is Huigra, Ecuador, altitude 4,000 feet.—*T. J. Fitzpatrick.*

4663. Rose, J. N. **Graptopetalum pachyphyllum.** Addisonia 7: 45, 46. *Pl. 247 (col.).* 1922.—This Crassulaceous species, here described as new, was discovered in 1905 in Querétaro, Mexico.—*T. J. Fitzpatrick.*

4664. Rose, J. N. **Runyonia longiflora.** Addisonia 7: 39, 40. *Pl. 244 (colored).* 1922.—**Runyonia** (Amaryllidaceae) gen. nov. and *R. longiflora* sp. nov. are described as new. This plant, from southeastern Texas and northern Mexico, was discovered by Arthur Schott in 1853 and sent to the Torrey herbarium; it was rediscovered by Robert Runyon in 1921.—*T. J. Fitzpatrick.*

REVISIONS AND MONOGRAPHS

4665. Britton, N. L., and J. N. Rose. **The Cactaceae, descriptions and illustrations of plants of the Cactus family.** Vol. III. Carnegie Inst. Washington Publ. 248. *23 + 29 cm., vii + 255 p., 24 pl. (19 colored), 250 fig.* Oct. 12, 1922.—The subtribes *Echinocereanae, Echinocactanae* and *Cactanae*, of the tribe *Cereeae*, are treated in this volume. Thirty-six genera and 306 species are recognized and are described with complete bibliography, type locality, distribution, and list of previously published illustrations. There are 21 new genera, as follows: **Austrocactus, Chamaecereus, Lobivia, Denmoza, Copiapoa, Toumeya, Epithelantha, Neoporteria, Arequipa, Oroya, Matucana, Hamatocactus, Strombocactus, Ferocactus, Echinomastus, Homalocephala, Hickenia, Frailea, Mila, Sclerocactus,** and **Utahia.** There are 36 new species, as follows: *Echinocereus grandis, E. Standleyi, E. perbellus, E. Fitchii, E. scopulorum, E. Palmeri, E. Lloydii, E. sarissophorus, E. Barthelowanus, Lobivia Bruchii, L. ferox, L. longispina, L. boliviensis, L. Shaferi, L. pampana, L. grandiflora, L. grandis, Echinopsis Spegazziniana, E. Shaferi, E. aurea, Copiapoa megarhiza, Echinofossulocactus Lloydii, E. zacatecasensis, E. confusus, Ferocactus Townsendianus, F. horridus, F. santa-maria, F. Covillei, F. Rostii, Mila caespitosa, Discocactus subnudus, D. Zehntneri, D. bahiensis, Cactus Broadwayi, C. bahiensis,* and *C. Zehntneri.* There are 2 new names as follows: *Gymnocalycium Spegazzinii* and *Cactus Townsendii.* There are 156 new combinations with name-carrying synonyms in parentheses, as follows: *Echinocereus pacificus* (*Cereus phoeniceus pacificus* Engelm.), *E. octacanthus* (*Echinopsis octacantha* Mühlenpfordt), *E. sciurus* (*Cereus sciurus* Brandg.), *E. mamillatus* (*Cereus mamillatus* Engelm.), *Austrocactus Bertinii* (*Cereus Bertini* Cels), *Rebutia pseudominuscula* (*Echinopsis pseudominuscula Speg.*), *R. pygmaea* (*Echinopsis pygmaea* Fries), *R. Steinmannii* (*Echinocactus Steinmannii* Solms-Laubach), *Chamaecereus Silvestrii* (*Cereus Silvestrii* Speg.), *Lobivia cachensis* (*Echinopsis cachensis* Speg.), *L. caespitosa* (*Echinopsis caepitosa* Purpus), *L. saltensis* (*Echinopsis saltensis* Speg.), *L. cinnabarina* (*Echinocactus cinnabarius* Hooker), *L. Pentlandii* (*Echinocactus Pentlandii* Hooker), *L. lateritia* (*Echinopsis lateritia* Gürke), *L. corbula* (*Mammillaria corbula* Herrera), *L. andalgalensis* (*Cereus andalgalensis* Weber), *L. haematantha* (*Echinocactus haematanthus* Speg.), *L. thionanthus* (*Echinocactus thionanthus* Speg.), *L. chionanthus* (*Echinocactus chionanthus* Speg.), *L. Cumingii* (*Echinocactus Cumingii* Hopffer), *Denmoza rhodacantha* (*Echinocactus rhodacanthus* Salm-Dyck), *Copiapoa cinerea* (*Echinocactus cinereus* Philippi), *C. marginata* (*Echinocactus marginatus* Salm-Dyck), *C. coquimbana* (*Echinocactus coquimbanus* Karwinsky), *C. cinerascens* (*Echinocactus cinerascens* Salm-Dyck), *C. echinoides* (*Echinocactus echinoides* Lemaire), *Toumeya papyracantha* (*Mammillaria papyracantha* Engelm.), *Epithelantha micromeris* (*Mammillaria micromeris* Engelm.), *Neoporteria nidus* (*Echinocactus nidus* Söhrens), *N. occulta* (*Echinocactus occultus* Philippi), *N. nigricans* (*Echinopsis nigricans* Linke), *N. Jussieui* (*Echinocactus Jussieui* Monville), *N. subgibbosa* (*Echinocactus subgibbosus* Haworth), *N. chilensis* (*Echinocactus chilensis* Hildmann), *N. fusca* (*Echinocactus fuscus* Mühlenpfordt), *Arequipa leucotricha* (*Echinocactus leucotrichus* Philippi), *A. myriacantha* (*Echinocactus myriacanthus* Vaupel), *Oroya peruviana* (*Echinocactus peruvianus Schumann*), *Matucana Haynei* (*Echinocactus Haynii* Otto), *Hamatocactus setispinus* (*Echinocactus setispinus* Engelm.), *Strombocactus disciformis*

(*Mamillaria disciformis* DC.), *Echinofossulocactus hastatus* (*Echinocactus hastatus* Hopffer), *E. multicostatus* (*Echinocactus multicostatus* Hildmann), *E. Wippermannii* (*Echinocactus Wippermannii* Mühlenpfordt), *E. heteracanthus* (*Echinocactus heteracanthus* Mühlenpfordt), *E. albatus* (*Echinocactus albatus* Dietrich), *E. lamellosus* (*Echinocactus lamellosus* Dietrich), *E. grandicornis* (*Echinocactus grandicornis* Lemaire), *E. arrigens* (*Echinocactus arrigens* Link), *E. violaciflorus* (*Echinocactus violaciflorus* Quehl), *E. pentacanthus* (*Echinocactus pentacanthus* Lemaire), *E. dichroacanthus* (*Echinocactus dichroacanthus* Martius), *E. tricuspidatus* (*Echinocactus tricuspidatus* Scheidweiler), *E. lancifer* (*Echinocactus lancifer* Dietrich), *Ferocactus Stainesii* (*Echinocactus Stainesii* Hooker), *F. Pringlei* (*Echinocactus pilosus Pringlei* Coulter), *F. Fordii* (*Echinocactus Fordii* Orcutt), *F. chrysacanthus* (*Echinocactus chrysacanthus* Orcutt), *F. Wislizeni* (*Echinocactus Wislizeni* Engelm.), *F. Lecontei* (*Echinocactus Lecontei* Engelm.), *F. acanthodes* (*Echinocactus acanthodes* Lemaire), *F. Diguetii* (*Echinocactus Diguetii* Weber), *F. peninsulae* (*Echinocactus peninsulae* Weber), *F. rectispinus* (*Echinocactus Emoryi rectispinus* Engelm.), *F. Orcuttii* (*Echinocactus Orcuttii* Engelm.), *F. robustus* (*Echinocactus robustus* Link & Otto), *F. echidne* (*Echinocactus echidne* DC.) *F. alamosanus* Britton & Rose (*Echinocactus alamosanus* Britton & Rose), *F. glaucescens* (*Echinocactus glaucescens* DC.), *F. flavovirens* (*Echinocactus flavovirens* Scheidweiler), *F. melocactiformis* (*Echinocactus melocactiformis* DC.), *F. macrodiscus* (*Echinocactus macrodiscus* Martius), *F. viridescens* (*Echinocactus viridescens* Torrey & Gray), *F. Johnsonii* (*Echinocactus Johnsonii* Parry), *F. nobilis* (Cactus *nobilis* L.), *F. latispinus* (*Cactus latispinus* Haworth), *F. crassihamatus* (*Echinocactus crassihamatus* Weber), *F. uncinatus* (*Echinocactus uncinatus* Galeotti), *F. hamatacanthus* (*Echinocactus hamatocanthus* Mühlenpfordt), *Echinomastus erectocentrus* (*Echinocactus erectocentrus* Coulter), *E. intertextus* (*Echinocactus intertextus* Engelm.), *E. dasyacanthus* (*Echinocactus intertextus dasyacanthus* Engelm.), *E. unguispinus* (*Echinocactus unguispinus* Engelm.) *E. Macdowellii* (*Echinocactus Macdowellii* Rebut), *E. durangensis* (*Echinocactus durangensis* Runge), *Gymnocalycium Mihanovichii* (*Echinocactus Mihanovichii* Frič & Gürke), *G. Netrelianum* (*Echinocactus Netrelianus* Monville), *G. Leeanum* (*Echinocactus Leeanus* Hook.), *G. Guerkeanum* (*Echinocactus Guerkeanus* Heese), *G. hyptiacanthum* (*Echinocactus hyptiacanthus* Lemaire), *G. saglione* (*Echinocactus saglionis* Cels), *G. brachyanthum* (*Echinocactus brachyanthus* Gürke), *G. Anisitsii* (*Echinocactus Anisitsii* Schumann), *G. Monvillei* (*Echinocactus Monvillei* Lemaire), *G. melanocarpum* (*Echinocactus melanocarpus* Arechavaleta), *G. uruguayense* (*Echinocactus uruguayensis* Arechavaleta), *G. megalothelos* (*Echinocactus megalothelos* Sencke), *G. Kurtzianum* (*Echinocactus Kurtzianus* Gürke), *G. Damsii* (*Echinocactus Damsii* Schumann), *G. platense* (*Echinocactus platensis* Speg.), *G. Schickendantzii* (*Echinocactus Schickendantzii* Weber), *G. Stuckertii* (*Echinocactus Stuckertii* Speg.), *G. Joossensianum* (*Echinocactus Joossensianus* Bödeker), *Homalocephala texensis* (*Echinocactus texensis* Hopffer), *Astrophytum capricorne* (*Echinocactus capricornis* Dietrich), *A. ornatum* (*Ehinocactus ornatus* DC.), *Eriosyce ceratistes* (*Echinocactus ceratistes* Otto), *Malacocarpus Schumannianus* (*Echinocactus Schumannianus* Nicolai), *M. Grossei* (*Echinocactus Grossei* Schumann), *M. nigrispinus* (*Echinonocactus nigrispinus* Schumann), *M. Reichei* (*Echinocactus Reichei* Schumann), *M. napinus* (*Echinocactus napinus* Philippi), *M. apricus* (*Echinocactus apricus* Arechavaleta), *M. concinnus* (*Echinocactus concinnus* Monville), M. *tabularis* (*Echinocactus concinnus tabularis* Cels), *M. Scopa* (*Cactus Scopa* Sprengel), *M. pulcherrimus* (*Echinocactus pulcherrimus* Arechavaleta), *M. muricatus* (*Echinocactus muricatus* Otto), *M. Linkii* (*Cactus Linkii* Lehmann), *M. Ottonis* (*Cactus Ottonis* Lehmann), *M. catamarcensis* (*Echinocactus catamarcensis* Speg.), *M. patagonicus* (*Echinocactus patagonicus* Weber), *M. Langsdorfii* (*Cactus Langsdorfii* Lehmann), *M. mammulosus* (*Echinocactus mammulosus* Lemaire), *M. islayensis* (*Echinocactus islayensis* Forster), *M. Strausianus* (*Echinocactus Strausianus* Schumann), *M. Haselbergii* (*Echinocactus Haselbergii* Haage), *M. Maassii* (*Echinocactus Maassii* Heese), *M. tuberisulcatus* (*Echinocactus tuberisulcatus* Jacobi), *M. curvispinus* (*Cactus curvispinus* Bertero), *M. mammillarioides* (*Echinocactus mammillarioides* Hooker), *M. Leninghausii* (*Pilocereus Leninghausii* Haage jr.), *M. Graessneri* (*Echinocactus Graessneri* Schumann), *M. escayachensis* (*Echinocactus escayachensis* Vaupel), *Hickenia microsperma* (*Echinocactus microspermus* Weber), *Frailea gracillima* (*Echinocactus gracillimus* Monville), *F. Grahliana* (*Echinocactus Grahlianus* Haage jr.), *F. pumila* (*Echinocactus pumilus* Lemaire), *F. Schilinzkyana* (*Echinocactus Schilinzkyanus*

Haage jr.,) *F. cataphracta* (*Echinocactus cataphractus* Dams), *F. pygmaea* (*Echinocactus pygmaeus* Speg.), *F. caespitosa* (*Echinocactus caespitosus* Speg.), *F. Knippeliana* (*Echinocactus Knippelianus* Quehl), *Sclerocactus Whipplei* (*Edhinocactus Whipplei* Engelm.), *F. polyancistrus* (*Echinocactus polyancistrus* Engelm. & Bigelow) *Utahia Sileri* (*Echinocactus Sileri* Engelm.), *Discocactus Hartmannii* (*Echinocactus Hartmannii* Schumann), *D. heptacanthus* (*Malacocarpus heptacanthus* Rodrigues), *Cactus Lemairei* (*Echinocactus Lemarii* Monville), *C. oreas* (*Melocactus oreas* Miquel), *C. Ruestii* (*Melocactus Ruestii* Schumann), *C. salvador* (*Melocactus salvador* Murillo), *C. obtusipetalus* (*Melocactus obtusipetalus* Lemaire), and *C., Neryi* (*Melocactus Neryi* Schumann). [See also Bot. Absts. 3, Entry 1824; 7, Entry 2194; 12, Entry 4667.]—*J. N. Rose.*

4666. Maiden, J. H. **A critical revision of the genus Eucalyptus.** Vol. VI. Part 6. *P. 255–340, pl. 228–231.* John Spence: Sydney. September, 1922.—The present part contains descriptions and illustrations of the following Australian species: *Eucalyptus Jenseni* n. sp., *E. umbrawarrensis* n. sp., *E. leptophylla* F. v. M., *E. uncinata* Turcz., *E. angusta* n. sp., *E. marginata* Sm., *E. buprestium* F. v. M., *E. Bosistoana* F. v. M., *E. altior* (*E. Luehmanniana* F. v. M. var. *altior* Deane & Maiden), *E. conglobata* (*E. dumosa* A. Cunn. var. *conglobata* (R. Br.) Benth.), *E. angulosa* Schauer, and *E. Johnstoni* n. sp. A chapter is added in which the author presents a general discussion on the leaf of *Eucalyptus.*—*J. M. Greenman.*

4667. Taylor, Norman. [Rev. of: Britton, Nathaniel L., and J. N. Rose. **The Cactaceae, descriptions and illustrations of plants of the Cactus family.** Vol. III. Carnegie Inst. Washington Publ. 248. 1922 (see Bot. Absts. 12, Entry 4665).] Science 57: 272–273. 1923.

4668. Williamson, H. B. **A revision of the genus Pultenaea, Part II.** Proc. Roy. Soc. Victoria 33: 133–148. *Pl. 6–7.* 1921.—This revision covers 34 species, including 4 new varieties and 4 new species, as follows: *Pultenaea humilis* Benth. var. *glabrescens*, *P. juniperina* Labitt. var. *planifolia*, *P. acerosa* R. Br. var. *acicularis*, *P. laxiflora* Benth. var. *pilosa*, *P. radiata*, *P. costata*, *B. recurvifolia*, and *P. divaricata.* One new combination, *P. ferruginia* Rudge var. *Deanei* (*P. Deanei* R. T. Baker) is made.—*Eloise Gerry.*

FLORISTICS AND PLANT DISTRIBUTION

4669. Bennett, Arthur. **Pyrola rotundifolia Linn. in Caithness, with notes on the genus.** Trans. and Proc. Bot. Soc. Edinburgh 28: 71–75. 1921.—The distribution of this and allied species in Scotland is discussed.—*Roxana Stinchfield Ferris.*

4670. Chun, Woon Young. **[Chinese pines compared with the Japanese pines cultivated in China.]** Ko-Hsueh [Science-Publ. Chinese Sci. Soc.] 7: 379–384. 1922. [Text in Chinese.]—The author gives an analytical key to 2 groups of pines: *Haploxylon* and *Diploxylon.* The following species are given detailed descriptions: *Pinus Massoniana* D. Don, *P. Armandi* Franch., *P. Bungeana* Zucc, *P. sinensis* Lamb., and *P. densiflora* Sieb. & Zucc. of Chinese pines and *P. Thunbergii* Parl., *P. koraiensis* Sieb. & Zucc., and *P. parviflora* Sieb. & Zucc. of Japanese pines.—*Chunjen C. Chen.*

4671. Churchill, J. R. **Cimicifuga racemosa in Massachusetts.** Rhodora 23: 201–203. *Pl. 132.* 1921.—Two colonies of *Cimicifuga racemosa* (L). Nutt. near Sheffield, Berkshire County, are described; a photograph illustrates the extent of 1 colony. This species has rarely, if ever, been found indigenous in New England north of Connecticut.—*James P. Poole.*

4672. Cockerell, T. D. A. **Flora of Porto Santo.** Torreya 22: 4–10. *Fig. 1, 2.* 1922.—This island of the Madeiras is between 6 and 7 miles long and 3 miles across, reaching an altitude of 1,660 feet. The surface is rough and rocky, and the vegetation xerophytic. There are recorded 315 terrestrial vascular plants not in cultivation, to which the author adds

Adonis microcarpa DC.; only 7 of these are endemic. At least 160 species are introduced. The 3 Desertas islands, in plain sight from Porto Santo, have 138 species of vascular plants, with 2 endemic.—*J. C. Nelson.*

4673. Deam, Chas. C. **Trees of Indiana.** *1st rev. ed. 17 × 26 cm., 317 p., 137 pl.* Dept. Conservation State of Indiana: 1921.—Descriptions, and photographic illustrations from herbarium specimens, are given of the trees occurring naturally in Indiana. There are described 178 species and 29 varieties. Twenty-three species included in previous lists, are excluded because of the lack of sufficient evidence of their occurrence in the state. Measurements are given of some of the largest trees of common species that have been found in Indiana. —*Truman G. Yuncker.*

4674. Denslow, H. M. **An intensive local study in Rhode Island.** Torreya 23: 9–10. 1923.—Albert E. Lownes has intensively studied a square mile of terrain near Providence. *Habenaria hyperborea* (L.) R. Br. is new to Rhode Island. A hybrid Spiranthes was critically observed, apparently *S. cernua* × *gracilis.*—*J. C. Nelson.*

4675. Diels, L. **Die Theaceen Mikronesiens. [The Theaceae of Micronesia.]** Bot. Jahrb. 56: 526. 1921.—This is No. 13 of the series: Beiträge zur Flora von Mikronesien und Polynesien II, edited by L. Diels. *Eurya japonica* Thunb. and *E. japonica* Thunb. var. *nitida* Korth. are listed for this region.—*K. M. Wiegand.*

4676. Diels, L. **[List of determinations of plants collected in Chekiang.]** Ko-Hsueh [Science-Pub. Chinese Sci. Soc.] 7: 705–706. 1922. [Text in Chinese.]—The author presents a list of 61 plants collected in the province of Chekiang and determined with botanical names.—*Chunjen C. Chen.*

4677. Ehlers, J. H. **Panicum virgatum var. cubense in Michigan.** Rhodora 23: 200. 1921.—An abundant and vigorous growth of this variety was found in 1 locality in Cheboygan County. The species, *P. virgatum* L., has been reported previously in Michigan.—*James P. Poole.*

4678. Fernald, M. L. **The Gray Herbarium expedition to Nova Scotia. 1920. Part II. Noteworthy vascular plants collected in Nova Scotia, 1920.** Rhodora 23: 184–195, 223–245, 257–278, 284–300. 1921.—Part II contains an enumeration, with notes on their occurrence and critical discussions, of several hundred species, 110 of them new to the flora of Canada, 232 new to Nova Scotia. The newly described or renamed plants are: *Thelypteris palustris* f. *suaveolens* (Clute) n. comb., *Botrychium dissectum* f. *obliquum* (Muhl.) n. comb., *Panicum longifolium* var. *tusketense* n. var., *P. depauperatum* var. *psilophyllum* and f. *cryptostachys* n. var. and n. f., *P. linearifolium* var. *Werneri* (Scribn.) n. comb., *P. Lindheimeri* var. *septentrionale* n. var. var. *fasciculatum* (Torr.) n. comb., var. *implicatum* (Scribn.) n. comb., *Agrostis hyemalis* var. *elata* (Pursh) n. comb., *Glyceria grandis* f. *pallescens* n. f., *Agropyron pungens* var. *acadiense* (Hubbard) n. comb., *Eleocharis tuberculosa* var. *pubnicoensis* n. var., *Scirpus acutus* f. *congestus* (Farwell) n. comb., *S. atrovirens* var. *georgianus* (Harper) n. comb., *Eriophorum Chamissonis* f. *albidum* (F. Nylander) n. comb., *Cadium mariscoides* f. *congestum* n. f., *Carex scoparia* f. *peracuta* n. f., *C. albolutescens* var. *cumulata* × *scoparia* n. hybr., *Juncus effusus* var. *costulatus* n. var., *J. canadensis* var. *sparsiflorus* n. var., *J. subcaudatus* var. *planisepalus* n. var., *Lophiola septentrionalis* n. sp., *Habenaria flava* var. *virescens* (Muhl.) n. comb., *Pogonia ophioglossoides* var. *brachypogon* n. var., *Calopogon pulchellus* f. *albiflorus* (Britton) n. comb., *Polygonum robustius* (Small)n. comb., *P. hydropiperoides* var. *digitatum* n. var., *Drosera longifolia* × *rotundifolia* n. hybr., *Pyrus dumosa* (Greene) n. comb., *Amelanchier stolonifera* var. *lucida* n. var., *A. laevis* var. *nitida* (Wiegand) n. comb., *Rubus glandicaulis* var. *neoscoticus* n. var., *Ilex verticillata* var. *fastigiata* (Bicknell) n. comb., *Viola eriocarpa* var. *leiocarpa* Fernald & Wiegand n. var., *Bartonia paniculata* var. *intermedia* n. var., var. *sabulonensis* (Fernald) n. comb., var. *iodandra* (Robinson) n. comb., *Ascelpias incarnata* var. *neoscotia* n. var., *Mertensia*

maritiana f. *albiflora* n. f., *Lycopus uniflorus* f. *flagellaris* n. f., *Linaria vulgaris* f. *leucantha* n. f., *Agalinis neoscotica* (Greene) n. comb., *Utricularia subulata* f. *cleistogama* (Gray) n. comb., *Solidago uniligulata* var. *terrae-novae* (T. & G.) n. comb., var. *neglecta* (T. & G.) n. comb., *S. tenuifolia* var. *pycnocephala* n. var., *Antennaria appendiculata* n. sp., *A. neodioica* var. *chlorophylla* n. var., *A. petaloidea* var. *noveboracensis* n. var., *Bidens connata* var. *inundata* n. var., *Senecio pauperculus* var. *Balsamitae* (Muhl.) n. comb., *Prenanthes altissima* f. *hispidula* (Fernald) n. comb.—*M. L. Fernald.*

4679. Gardner, H. M. **Note on the occurrence of Podocarpus trees near Nairobi.** Jour. East Africa and Uganda Nat. Hist. Soc. No. 18. *P. 36–37.* 1923.—Record is made of a group of about 25 trees, apparently *Podocarpus gracilior*, found near Nairobi. One tree seems as much as 150 years old, and there are many seedlings. No other colony is known within 100 miles.—*Wm. Randolph Taylor.*

4680. Gray, Fred W. **Scores of stations for Gaylussacia brachycera in West Virginia.** Torreya **22:** 17–18. 1922.—*Gaylussacia brachycera* (Michx.) Gray, the box huckleberry, previously found at only 3 stations in the eastern U. S. A., has been reported from about 75 stations in West Virginia and Virginia. About 40 of these in 3 counties of West Virginia were confirmed by the writer during the summer of 1921. The common name for the plant in this region is Juniper Berry.—*J. C. Nelson.*

4681. Grimes, E. Jerome. **A new station for Pogonia affinis.** Rhodora **23:** 195–197. 1921.—A brief description is given of the location, topography, vegetation, and soil character at this station near Williamsburg, Virginia. Descriptions and measurements are given for the 15 plants found.—*James P. Poole.*

4682. Hardy, M. E. **Flora of the Michigan sand dunes.** Amer. Bot. **28:** 6–9. 1922.

4683. Hiern, W. P. **Tenth report of the botany committee.** Trans. Devonshire Assoc. Adv. Sci. Lit. and Art. **50:** 219–227. 1918.—Local lists of plants from the 8 botanical districts of Devonshire are given, the lists including not only vascular plants but also bryophytes, algae, and fungi. The longest lists are from the Barnstable and Torquay Districts, with 62 and 48 species, respectively. At the close of the report the editor reviews a paper by G. T. Harris on the Desmid Flora of Dartmoor, published in 1917.—*A. W. Evans.*

4684. Hollick, Arthur. **Local flora notes—Staten Island.** Torreya **22:** 1–3. 1922.—Many native species in this area have disappeared because of the growth of the community, and an equal number of alien species have been added. Two areas are of special interest (1) the Todt Hill area, an unglaciated ridge with a characteristic native flora. Ten introduced species rare or wanting elsewhere on the island are recorded. (2) The vicinity of Arlington station, made up of waste material. Of 16 introduced species found here in 1908, only 4 remained in 1921. Six species new to the flora of the island were noticed. The mass of the vegetation, made up of introduced weeds, seems permanently established.—*J. C. Nelson.*

4685. Johnston, H. H. **Additions to the flora of Orkney as recorded in Watson's "Topographical Botany," second edition (1883).** Trans. and Proc. Bot. Soc. Edinburgh **28:** 51–66. 1921.—This is the 3rd of a series of papers reporting additions to the flowering plants and cryptogams of Orkney.—*Roxana Stinchfield Ferris.*

4686. Lauterbach, C. **Die Simarubaceen Mikronesiens. [The Simarubaceae of Micronesia.]** Bot. Jahrb. **56:** 513–514. 1921.—This is no. 8 of the series: Beiträge zur Flora von Mikronesien und Polynesien II, edited by L. Diels. Only 3 genera, monotypic in that region, are known from these islands. The species are inhabitants of the coastal region, only 1 extending up the rivers. Those listed are: *Suriana maritima L.*, *Samadera indica* Gaertn., and *Soulamea amara* Lam.—*K. M. Wiegand.*

4687. Lauterbach, C. **Die Rhamnaceen Mikronesiens.** [The Rhamnaceae of Micronesia.] Bot. Jahrb. **56**: 524–525. 1921.—This is no. 12 of the series: Beiträge zur Flora von Mikronesien und Polynesien II, edited by L. Diels. Three species, *Smythea pacifica* Seem., *Colubrina asiatica* Brongn., and *Alphitonia excelsa* Reiss. are listed for this region.—*K. M. Wiegand.*

4688. Lauterbach, C. **Die Lecythidaceen Mikronesiens.** [The Lecythidaceae of Micronesia.] Bot. Jahrb. **56**: 527–528. 1921.—This is no. 14 of the series: Beiträge zur Flora von Mikronesien und Polynesien II, edited by L. Diels. Two species are listed: *Barringtonia racemosa* Bl. and *B. speciosa* L. f. The former is generally distributed at lower altitudes.—*K. M. Wiegand.*

4689. Lindström, A. **Marstrandsöns Ormbukar och Fanerogamer.** [The ferns and phanerogams of the Island of Marstrand.] Bot. Notiser **1920**: 177–210. 1920.—The island is very rocky and the shores very barren. A meager flora might be expected, especially as part of the island is occupied by the town and the old fortress. After 14 years of study by the author and partly by Nordstedt, a list of 13 fern worts and more than 600 species, varieties, and hybrids of phanerogams is published. Among these there are described 2 subspecies, 3 varieties, 1 hybrid and 19 species of *Rosa*. As the author has a very peculiar system in this genus, it is scarcely possible to tell whether these should be regarded as species or subspecies, he using binomials for both categories and calling both "sp. nov." As an appendix are added lists, without notes, of the plants found on neighbouring small islands: Hamneskär 33, Gråen 91, Östra Kråkan 76, Vestra Kråkan 52, and Kråkan at Rösselvik 56 species and varieties.—*P. A. Rydberg.*

4690. Long, Bayard. **A station for Croton glandulosus in New Jersey.** Rhodora **23**: 221–223. 1921.—A description is given of a large well established colony as a new station for this species along the railroad embankment near Atco, New Jersey. This is a tropical American species known in northeastern U. S. A. as one of the ballast plants formerly found about certain Atlantic seaports. It is suggested that this colony may have originated from seed dropped with car-sweepings.—*James P. Poole.*

4691. Long, C. A. E. **Some rare plants from Knox county, Maine.** Rhodora **23**: 198–199. 1921.—This is an addition to a previously published list of noteworthy Matinicus plants, together with a list of a few interesting species collected from other parts of Knox County.—*James P. Poole.*

4692. Lynes, H. **Notes on the natural history of Jebel Marra.** Sudan Notes and Records **4**: 119–137. 1921.—Notes are recorded of the occurrence of a number of vascular plants in this region, based on specimens obtained in the expedition of 1920.—*C. W. Dodge.*

4693. Merrill, E. D., L. Diels, and Rehder. **[List of determination of plants collected in Kiangsi and Chekiang.]** Ko-Hsueh [Science-Publ. Chinese Sci. Soc.] **7**: 958–964. 1922.—A list is given of 211 plants collected in the provinces of Kiangsi and Chekiang, with the botanical names.—*Chunjen C. Chen.*

4694. Nelson, Aven. **Flora of the Navajo Indian Reservation II.** Amer. Bot. **28**: 20–25. 1922.

4695. Nelson, James C. **Notes on the ballast-vegetation at Linnton, Oregon.** Torreya **23**: 1–3. 1923.—The list of plants as reported in Torreya **17**: 151–161. 1917, has been much diminished by the construction of a ship-yard on the area. A list is presented of 20 species that still persist, and seem likely to become permanent additions to the flora of Oregon.—*J. C. Nelson.*

4696. Parker, Charles S. **Lathyrus Nissolia a recent introduction in the state of Washington.** Rhodora 23: 246. 1921.—The author found this species growing on a dry hillside near Pullman, blooming in profusion about July 1.—*James P. Poole.*

4697. Rompaey, Em. van. **Ingebrachte planten in de omgeving van Antwerpen.** [Introduced plants in the vicinity of Antwerp.] Naturwettenschapp. Tijdschr. 3: 134–138. 1921.—The author presents a list of 80 introduced seed plants with notes on acclimatization and original sources of introduction.—*C. D. La Rue.*

4698. Small, John K. **Another Sonchus for America.** Torreya 21:100–101. 1921.—*Sonchus uliginosus*, Bieb., a species of Russia not previously reported from the U. S. A., is represented in the herbarium of the New York Botanical Garden by specimens collected near Hecktown, Northampton County, Pennsylvania, by Eugene A. Rau, July 21, 1921.—*J. C. Nelson.*

4699. Stancliff, J. O. **Botanical notes from Tahiti.** Amer. Bot. 29: 3–6. 1923.—A few popular notes on the common plants of that region are recorded.—*S. P. Nichols.*

4700. Stevens, O. A. **The Turtle Mountains of North Dakota.** Amer. Bot. 28: 9–14. 1922.—The author presents an account of the topography and flora of the region.—*S. P. Nichols.*

4701. Tovey, J. R. **The introduced flora of Victoria.** Jour. Dept. Agric. Victoria 19: 614–618. *Fig. 1–6.* 1921.—Brief comments are given on 14 species of introduced plants.—*Wm. E. Lawrence.*

4702. White, C. T. **Notes on the genus Flindersia (Family Rutaceae.)** Proc. Linnean Soc. New South Wales 46: 324–329. 1921.—This genus was founded by R. Brown in 1814 on *Flindersia australis*, the "crow's ash" of Queensland or "teak" of northern N. S. W. Eighteen species are known, only 3 of which are found outside Australia. The others all grow in Queensland while 6 of these extend into N. S. W. The genus includes some of the most important timbers of Eastern Australia, as "crow's ash" (*F. australis*), "yellow wood" (*F. Oxleyana*), "North Queenland maple" (*F. Brayleyana*), "silk wood" (*F. Pimenteliana*), and "silver beech" or "Putts pine" (*F. acuminata*). Detailed notes and references are given on the following species: *F. Pimenteliana* F. v. Muell., *F. Bourjotiana* F. v. Muell., *F. Brayleyana* F. v. Muell., *F. Schottiana* F. v. Muell., F. *pubescens* (F. v. Muell.), Bail., *F. collina* Bail., *F. maculosa* (Lindl.) Benth., *F. Strzeleckiana* F. v. Muell., *F. papuana* F. v. Muell. (doubtful).—*Eloise Gerry.*

MISCELLANEOUS, UNCLASSIFIED PUBLICATIONS

Burton E. Livingston, *Editor*

Sam F. Trelease, *Assistant Editor*

4703. Anonymous. **Ore deposits revealed by plants.** Sci. Amer. 127: 100. 1922.—This is a summary of an article by Lidgely, E., in Proc. Australian Mining Inst., the date is not given. In Michigan and Wisconsin *Amorpha canescens* indicated the presence of underlying galena beds; *Convolvulus althaeoides* in Spain showed the presence of underlying deposits of phosphate ore; and in Montana, *Erigonum ovalifolium* the existence of silver ores; etc.—*Chas. H. Otis.*

4704. Andrews, F. M. **Trillium nivale.** Proc. Indiana Acad. Sci. 1921: 81–86. *Pl. 1, 1 fig.* 1922.—Specimens of *Trillium nivale*, transplanted from the woods, were kept under observation for several years. Many phases of the plants were studied.—*F. C. Anderson.*

4705. Atkins, W. R. G. **The preparation of permanently non-acid formalin for preserving calcareous specimens.** Jour. Marine Biol. Assoc. United Kingdom [Plymouth] 12: 792–794. 1922.—Commercial formalin, 40 per cent, may be as acid as pH 2.8. Formalin that is permanently non-acid and only slightly alkaline, close to pH 9, may be prepared by the addition of borax until a good red color is shown with phenolphthalein, or a slaty blue with thymol blue, when added to the diluted formalin.—*Marshall A. Howe.*

4706. Benedict, R. C. **A Fern Society campaign for wild plant conservation.** Amer. Fern. Jour. 12: 131–133. 1922.

4707. Benedict, R. C. **Progress of the Fern Society program for wild plant protection.** Amer. Fern Jour. 13: 18–22. 1923.—The article contains comments on the question of "game laws" and a plea for cooperation in the preservation of wild plant life.—*F. C. Anderson.*

4708. Castle, H. **The catapult of the fern.** Sci. Amer. 127: 330. *5 fig.* 1922.—This is a popular article on the sporangium and dispersal of spores in ferns.—*Chas. H. Otis.*

4709. Collins, J. H. **Sugars of great price.** Sci. Amer. 126: 313, 362–363. *2 fig.* 1922.—The author considers the prices, characteristics, and some of the uses of rare sugars.—*Chas. H. Otis.*

4710. Gardenwitz, A. **Plants as inventors.** Sci. Amer. 126: 402–403. *6 fig.* 1922.—A brief review is given of Francé, R. H., Die Pflanze als Erfinder, in which it is shown that sound engineering principles are practiced by plants.—*Chas. H. Otis.*

4711. Hausman, L. A. **The microscopy of foods. A study of starch, the world's premier alimental substance.** Sci. Amer. 127: 256–257. *7 fig.* 1922.—This is a popular treatment of the subject.—*C. H. Otis.*

4712. Kegel, K. **Aufbereitung und wirtschaftliche Verwendung der Kohlen, insbesondere der Braunkohlen.** [Preparation and industrial use of coal, especially lignite.] Naturwissenschaften 10: 855–861, 882–888. *10 fig.* 1922.

4713. Klugh, A. B. **The plunger pipette—a new instrument for isolating minute organisms.** Jour. Roy. Microsc. Soc. London 1922: 267–268. *1 fig.* 1922.—A description is given of a capillary pipette with a delicate glass rod plunger actuated by pressure on the end of the rod and controlled by the resiliency of a piece of rubber tube connecting the pipette with the glass rod.—*Wm. Randolph Taylor.*

4714. McClung, L. **The seventy-five mile city.** Sci. Amer. 127: 156–157, 213–214. *3 fig.* 1922.—This popular exposition of Henry Ford's proposed development of Muscle Shoals presents the agricultural and fertilizer manufacturing aspects.—*Chas. H. Otis.*

4715. Sheppard, E. J. **A new method of treating and mounting celloidin sections.** Jour. Roy. Microsc. Soc. London 1921: 20–22. 1921.—Mounts from 95 per cent alcohol to "Euparal" were satisfactory, the method counteracting the frilling of the celloidin and furnishing a simplified technique.—*Wm. Randolph Taylor.*

4716. Strachan, J. **The microscope in the paper mill.** Jour. Roy. Microsc. Soc. London 1922: 249–260. 1922.—With the introduction of many new fibers into paper manufacture in the latter half of the 19th century, the use of the microscope increased for the determination of these fibers. It is also used in the identification of sizing starches, mineral filling powders and foreign matter, and in connection with the control of fiber length, the grinding of pulp, etc. An outline is given of new or little known ways in which the microscope could be used in commercial practice.—*Wm. Randolph Taylor.*

4717. Sutcliffe, H. **The use of the microscope in the rubber industry (Eastern plantations).** Jour. Roy. Microsc. Soc. London **1922**: 245–248. *Pl. 12, 13.* 1922.—The microscope is used to detect the presence of faults, such as air bubbles, water droplets, rust due to bacteria, yeasts and molds in the pans, and fragments of the bark of the tapped tree; also in the study of diseases of the trees.—*Wm. Randolph Taylor.*